

REPORT
OF
THE HEALTH SURVEY
AND PLANNING COMMITTEE

(August 1959—October 1961)

Vol. I



GOVERNMENT OF INDIA
MINISTRY OF HEALTH

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MINISTRY OF HEALTH

**REPORT OF THE HEALTH SURVEY AND
PLANNING COMMITTEE**

CHAPTER I

CONSTITUTION OF THE COMMITTEE AND ITS TERMS OF REFERENCE

CONTENTS

- (1) Appointment of the Health Survey and Planning Committee
composition — terms of reference final constitution.
- (2) Procedure and Methods.

CHAPTER I

CONSTITUTION OF THE COMMITTEE AND ITS TERMS OF REFERENCE

1. Appointment of the Health Survey and Planning Committee :
Terms of Reference ; Composition ; Inauguration ; Procedure and Methods.

Appointment of Committee

The Government of India in the Ministry of Health set up a Committee on the 12th June, 1959, to undertake the review of the developments that have taken place since the publication of the report of the Health Survey and Development Committee (Bhore Committee) in 1946 with a view to formulate further health programmes for the country in the third and subsequent five-year plan periods. The terms of reference of this Committee were as follows :

Terms of Reference

1. The assessment (or evaluation) in the field of medical relief and public health since the submission of the Health Survey and Development Committee's Report (the Bhore Committee) ;
2. Review of the First and Second Five-Year Plan Health projects ; and
3. Formulation of recommendations for the future plan of health development in the country.

The following was the composition of the Committee at the time of its constitution : *

- | | |
|---|-----------------|
| 1. Dr. A. Lakshmanaswami Mudaliar,
Vice-Chancellor, Madras University. | <i>Chairman</i> |
| 2. Shri Tirumal Rao, M.P., | <i>Member</i> |
| 3. Dr. G. S. Melkote, M.P., | " |
| 4. Shri V. K. B. Pillai, I.C.S.,
Secretary, Union Ministry of Health. | " |
| 5. Dr. C. O. Karunakaran,
President, Indian Medical Association. | " |

* Govt. of India, Ministry of Health letter No. F. 3-5/59-P, dt. 12-6-1959.

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| 6. | Lt.-Gen. B. Chaudhuri,
Director-General, Armed Forces Medical Services,
Ministry of Defence. | Member |
| 7. | Lt.-Col. Jaswant Singh,
Director-General of Health Services. | " |
| 8. | Lt.-Gen. D. N. Chakravarti,
Director of Health Services, West Bengal. | " |
| 9. | Dr. Dukhan Ram,
Vice-Chancellor, Bihar University. | " |
| 10. | Dr. C. G. Pandit,
Director, Indian Council of Medical Research. | " |
| 11. | Dr. V. S. Mangalik,
Principal, K. G. Medical College, Lucknow. | " |
| 12. | Major K. N. Rao,
Director of Medical Services, Andhra Pradesh. | " |
| 13. | Dr. (Miss) H. M. Lazarus,
King George Hospital, Visakhapatnam,
Andhra Pradesh. | " |
| 14. | Dr. P. M. Mehta,
Jamnagar. | " |
| 15. | Dr. K. C. K. E. Raja, | Member-Secretary |
| 16. | Dr. T. R. Tewari, | " |

Dr. R. V. Sathe was appointed as additional member of the Committee. Later Dr. K. C. K. E. Raja having been appointed as the Vice-Chancellor of the Kerala University ceased to be one of the Member-Secretaries. Dr. T. R. Tewari continued as Member-Secretary of the Committee. Lt.-Gen. B. M. Rao became a Member of the Committee on his appointment as Director-General of Armed Forces, Medical Services in place of General Chaudhuri. Both Gen. Chaudhuri and Gen. Rao continued as members after their respective retirements from the post of D.G., A.F.M.S. Lt.-Col. Jaswant Singh, Director-General of Health Services, having retired and having taken up a position in the World Health Organisation, his successor Lt.-Col. V. Srinivasan was appointed as a member. Later Dr. V. S. Mangalik, consequent on his taking up an assignment in Burma, resigned his membership of the Committee. Shri V. K. B. Pillai resigned from the Committee in November 1960.

The vacancies caused by the resignation of the two members referred to above were not, however, filled up. Thus the Committee at

the time of the submission of this report consisted of sixteen members as below :

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|---|------------------|
| 1. Dr. A. Lakshmanaswami Mudaliar,
Vice-Chancellor, University of Madras, Madras. | Chairman |
| 2. Shri Tirumal Rao, M.P., | Member |
| 3. Dr. G. S. Melkote, M.P., | " |
| 4. Lt.-Col. V. Srinivasan,
Director-General of Health Services,
Ministry of Health, New Delhi. | " |
| 5. Lt.-Gen. D. N. Chakravarti,
Director of Health Services and Secretary,
Health Department, West Bengal, Calcutta. | " |
| 6. Major K. N. Rao,
Director of Medical Services, Hyderabad. | " |
| 7. Dr. K. C. E. Raja,
Vice-Chancellor, Kerala University, Trivandrum. | " |
| 8. Dr. Dukhan Ram,
Ex-Vice Chancellor, Bihar University, Patna. | " |
| 9. Dr. C. G. Pandit,
Director, I.C.M.R., New Delhi. | " |
| 10. Dr. (Miss) H. M. Lazarus,
Professor of Obstetrics and Gynaecology,
K. G. Medical College, Visakhapatnam. | " |
| 11. Dr. C. O. Karunakaran,
Ex-President, Indian Medical Association,
Trivandrum. | " |
| 12. Lt.-Gen. B. Chaudhuri,
(Retd. D.G., A.F.M.S.),
59, Defence Colony, New Delhi. | " |
| 13. Lt.-Gen. B. M. Rao,
(Retd. D.G., A.F.M.S.), New Delhi. | " |
| 14. Dr. R. V. Sathe,
Bombay. | " |
| 15. Dr. P. M. Mehta,
Ex-Director, Jamnagar Research Institute,
Jamnagar. | " |
| 16. Dr. T. R. Tewari,
Director, C. H. S., New Delhi. | Member-Secretary |

2. Procedure and Methods

The Health Survey and Planning Committee was inaugurated on the 12th August 1959, at New Delhi by the Hon'ble Shri D. P. Karmarkar, Minister of Health, Government of India. In the course of the inaugural address the Hon'ble Minister stated "The principles enunciated by the Bhore Committee in the foreword and in the summary of the report are, to my mind, as valid today as they were at that time. I feel that twelve years of development necessitate today a resurvey of the whole field of health including its preventive and social aspects—medical relief, preventive health care, water supply, environmental sanitation, medical education and self-sufficiency in the supply of drugs and medical appliances as well as the place of indigenous systems of medicine in the health programme of the country. This review should be attempted not only in the light of existing conditions in India but also in relation to the rapid advances that have been made in other parts of the world.

Continuing, the Hon'ble Minister said "There is a distinction between the functions of this Committee and those of what is known as the Working Group for the Third Five-Year Plan. We do not want to fetter the work of the Committee with the limitations that may be associated with the Third Five-Year Plan. We wish that the Committee would consider Health in the scheme of national development as a whole and that it would base its recommendations on an assessment of the part that the health programme should play in promoting the physical and mental efficiency of the people and their working capacity to the highest possible level. At the same time I am sure the Committee will keep in mind, when making its recommendations, the realities of the situation in our country. Let me assure the Committee that we do not want to limit in any way its independence in the task that it has undertaken."

The Chairman, while thanking the Hon'ble Minister and others present on the occasion, stated "You mentioned, Sir, that you and the Ministry would not offer advice to the Committee. I shall always welcome advice, provided you and all of us understand clearly that what is offered is only advice and that the conclusions to be reached will be left to us, after taking as much of the advice into consideration as may be possible. I wish to assure you that we want advice from every available source, provided we have freedom to deal with such advice as we may deem fit. I am glad that an assurance has been given that we shall be allowed to work in the Committee without commitments of any sort and we, in our turn, hope that we shall be in a position to give you and your colleagues in the Cabinet a report that will be not only practi-

cal, but also fair and firm in its assessment of our health problems and in the recommendations we make to solve these problems. It will be our endeavour to avoid both exaggeration and skipping over of essential matters; we shall attempt to present our report on a factual basis and with a view to the implementation of the proposals as early as possible. We realise that it is a tremendous task that lies before us, but we shall try to fulfil it to the best of our ability."

The Committee decided to set up six sub-committees for the following purposes:

- Professional Education and Research;*
- Medical Relief (Urban and Rural);*
- Public Health including Environmental Hygiene;*
- Communicable diseases;*
- Population problem and family planning; and*
- Drugs and medical stores.*

It was decided that the main Committee should meet at certain important centres, but that the sub-committees should visit different States with a view to familiarise themselves with the present conditions of public health, medical relief, medical education and associated problems, which are to be dealt with in the report. These sub-committees were in some instances the sub-committees appointed for specific purposes at the first meeting and in certain cases they were *ad hoc* committees consisting of some members of the Health Survey and Planning Committee.

The first phase of the work of the Committee consisted of (a) elucidating information and views through Questionnaires (b) visits to representative institutions (c) interviews with representatives of organisations and individuals and (d) scrutiny of the memoranda received from various sources.

Questionnaires on Medical Education, Urban and Rural Medical Relief, Medical Research, Drugs, Indigenous Systems of Medicine and Public Health Administration were issued to heads of medical colleges, health departments in State Governments, the nursing profession, pharmaceutical trade and industry, scientific bodies etc. Copies of these questionnaires may be seen in Appendix I. A total number of 907 questionnaires were sent out, to which 665 replies were received.

Details regarding the visits of the main Committee, Sub-Committees and special groups of the Committee to various centres in India, the institutions visited, the persons interviewed etc. may be seen in Appendix II.

In addition, the Committee took advantage of the visit to India of a certain number of distinguished medical men and administrators in foreign countries in connection with the World Health Assembly in February 1961 and heard their views, experiences and suggestions on various health problems. The names of these individuals may be seen in Appendix III.

The main Committee met thrice at Delhi, four times at Madras, once at Hyderabad, once at Bombay and once at Calcutta. The Sub-Committees and groups visited all the States in India except Kashmir. A visit was planned to Jammu and Kashmir but owing to conditions of weather it had to be cancelled and could not be undertaken later.

CHAPTER II

INTRODUCTORY

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(1) Introduction

- (i) *Health conditions in India as found by the Health Survey and Development Committee.*
- (ii) *Recommendations of the Health Survey and Development Committee.*

(2) Important developments that have taken place since the Health Survey and Development Committee's Report (Bhore Committee Report — 1946).

Attainment of Independence

Partition

Merger of Princely States

Reorganisation of States

Abolition of Indian Medical Service, Women's Medical Service and Medical Research Department

Planning Commission

First, Second and Third Five Year Plans

Community Development

Action taken on the Bhore Committee's recommendations — general review

(3) Constitutional changes regarding health administration.

CHAPTER II

INTRODUCTORY

1. INTRODUCTION

1. Health conditions in India as found by the Health Survey & Development Committee (Bhore Committee)

The Bhore Committee, which was appointed by the Government of India in October 1943 to make a survey of the existing position in regard to health conditions and health organisation in what was then known as *British India* and to make recommendations for future developments, found that they had to confine themselves mainly to statistics of ill-health and death, in the absence of data on positive health.

That Committee found that the general death rate in "British India" was 22.4, the infantile mortality rate was 162, and the expectation of life at birth was 26.91 for males and 26.56 for females. Nearly half the total number of deaths were among children under 10 years of age and in this age group one-half of the mortality took place within the first year of life.

In 1938 the maternal mortality rate for the country as a whole was probably somewhere about 20 per 1,000 live-births.

The percentage of deaths in British India disease-wise was found to be Cholera 2.4, Smallpox 1.1, Plague 0.5, Fevers 58.4, Dysentery 4.2, Respiratory disease 7.6, and others 25.8.

Although vaccination had been in vogue for nearly eighty years, India continued to be a reservoir of smallpox.

Endemic diseases like leprosy, filariasis, guineaworm and hook-worm, though not contributing to a large extent to the mortality figures, caused considerable morbidity.

The Bhore Committee found that the low state of public health, as reflected in the high mortality and morbidity (particularly among mothers and children), was preventible and was mainly due to the absence of environmental hygiene, adequate nutrition, adequate preventive and curative health services and intelligent co-operation from the people themselves. To these causes may be added illiteracy, unemployment, poverty, purdah system and early marriages.

There was a wide prevalence of insanitary conditions in urban and rural areas. The provision for protected water supply and drainage was totally inadequate.

The food consumed by millions was both insufficient and ill-balanced.

The curative and preventive health services were totally inadequate. There were 1 doctor for 6,300, 1 nurse for 43,000, 1 health visitor for 400,000 and 1 midwife for 60,000.

Roughly one-fourth the number of doctors were in Government service, the rest being mostly settled in urban areas as private practitioners. Again there were only a total of 70 to 80 women medical officers in public service engaged purely in maternity and child welfare work. Very few of these were medical graduates.

Hospitals and dispensaries for providing medical relief to the people, particularly in the rural areas, were grossly insufficient and the quality of such services was very poor. There was only 0.24 bed per 1,000, while the minimum should be 10 beds per 1,000, taking all disease factors into consideration.

So far as Health administration was concerned, the Committee found a complete absence of the concept of simultaneous application of preventive and remedial measures.

Under the Government of India Act 1935, Provincial Governments were autonomous in the matter of internal health policy and administration. The work of the Central Advisory Board of Health was purely academic; but something more than mere exchange of views at the Board meetings was essential for proper execution of health plans formulated by the Board.

Health legislation was scattered over more than 40 enactments and there was need for unification as much as possible and for the enactment of a comprehensive Model Public Health Act as in Madras.

Health administration by Local Authorities was poor, because of lack of finance and personnel, and insufficient powers vested in the Directors of Public Health.

In rural dispensaries a lone doctor was struggling to deal with hundreds of patients. Medical Officers in charge of rural dispensaries were often out of touch with the methods of modern medical practice and consequently the standard of medical aid rendered by them was rather low.

The position of nursing staff, midwives and dais in medical institutions was unsatisfactory. The number of special hospitals in the country and the number of beds in them were too small. Medical relief by voluntary agencies did not amount to much. The progress made in providing wholetime Health Officers for rural and urban areas was very

little. Non-medical personnel employed in public health services did not generally have adequate training.

Provision for public health laboratory services was meagre and not uniform in all provinces.

There was an *immediate necessity* for the institution of effective control over the production of drugs. No effort had been made to recover valuable chemicals from coal tar which formed the basis of many synthetic drugs. There were few opportunities for the manufacture of surgical instruments. The surgical instrument industry mainly depended upon imported raw materials. The Drugs Act of 1940 required to be supplemented by legislation to regulate the practice of pharmacy.

Production of cereals in India was far below the country's requirements. Provision was lacking for proper storage and distribution of food. Food adulteration was widely prevalent. The responsibility for the prevention of food adulteration was that of the Provinces, but this was never rigorously enforced under the provisions of Provincial Food Adulteration Acts.

The school health programme then current in certain Provinces of British India only covered Middle and High Schools and not primary schools. The work was also carried on in a *perfunctory* manner. Environmental hygiene was totally absent in rural areas. Health education was insufficient. There was no provision for mid-day meals for children in schools.

The incidence of disease among industrial workers, who were generally migrants from rural areas, was high and migration from rural areas to towns was an important cause for the spread of infectious diseases like tuberculosis. There was overcrowding and inadequate housing among industrial workers. Many factories had no dispensaries. The Factories Act did not make any provision for the treatment of occupational diseases or for the payment of compensation to workers affected by such diseases. There was a lack of facilities for health work among women labourers in factories.

Local bodies were responsible for the control of epidemic diseases in their areas, but the existing health staff in many Provinces was quite insufficient to provide adequate service, nor were all local authorities inclined to enforce the provisions of the Act for the control of epidemic diseases.

The efforts that had been made by the authorities to control the incidence of malaria were too inadequate even to make a faint impression. This was because there was no separate organisation to deal with

malaria, nor was there adequate provision for the treatment of the millions of malaria cases occurring every year. Sufficient quinine was not made available and even where it was available the distribution was not carried out satisfactorily for want of staff.

Tuberculosis ranked high as a public health problem. The factors contributing to the spread of the disease were found to be malnutrition, under-nutrition and unhygienic conditions. The incidence of tuberculosis was believed to be higher in urban than in rural areas, although the infection was spreading throughout the country with the development of transport facilities and migration from villages to towns.

The position in regard to preventive measures against cholera, such as provision of protected water supply, satisfactory disposal of nightsoil and sale of food, was far from satisfactory.

Very little attention was paid to village planning. The Improvement Trusts in certain cities did not take interest in housing schemes, but merely dealt with land acquisition.

The majority of urban areas did not enjoy the benefit of safe water supply. In rural areas the source of water supply was generally unprotected and in many such places little or no attempt was made to secure any supply of water, let alone protected water supply.

The collection and disposal of excreta was the responsibility of municipalities and the standard of such service was very low. The unsatisfactory disposal of industrial wastes and the pollution of rivers by such wastes had affected the public health of the country and there was little or no control over such matters.

As regards internal quarantine, no attempt had been made to deal with the problem in a comprehensive manner and no organisation existed for the co-ordination of preventive measures which individual Provinces might carry out in their own territories or in co-operation with contiguous territories.

The available vital statistics in respect of births, deaths and notifiable diseases were all defective both in the matter of registration and compilation.

The Bhoré Committee found that so far as Medical Education was concerned too much detail was taught in basic medical sciences over a period of two years and that the practical application of these subjects to the clinical studies was not brought home to the students. They found that the transition from pre-clinical to clinical studies was abrupt and that in the period of clinical training the student did not have applied anatomy and applied physiology taught to him. The teaching

of the pre-clinical subjects was not organised in an atmosphere of research.

The number of teachers in most of the medical colleges was totally inadequate in comparison with the number of students. There was a lack of library and laboratory facilities in colleges. There was need for more efficient supervision and control of academic standards in medical colleges by the Universities concerned.

Progress in the abolition or conversion of medical schools was slow. There were few facilities for post-graduate education in the different medical colleges and even essential facilities for adequate instruction did not exist.

No special provision existed in the Universities for the training of teachers.

There were very few Dental Colleges and even these had insufficient accommodation, equipment and staff. Hardly any facilities existed for post-graduate training in dentistry.

Training schools for nurses were not of a uniform standard. The accommodation provided for pupil nurses was unsatisfactory and living conditions were deplorable.

There were only a few training centres for health visitors. The preliminary educational qualifications for admission, the period of training, the syllabus followed and the medium of instruction varied considerably from centre to centre and the standard of training in them was low.

Broadly speaking medical research received little attention in medical colleges except in a few extraordinary cases. The authorities responsible for staffing and financing the medical colleges were not always aware of the importance of research in relation to the achievement of a high standard of teaching and the development of a correct attitude of mind in the student.

2. Summary of the main recommendations of the Bhore Committee

In making their recommendations the Bhore Committee kept in view the following principles :

"No individual should fail to secure adequate medical care because of inability to pay for it.

"Health service should provide all consultant, laboratory and institutional facilities for proper diagnosis and treatment.

"The health programme must, from the very beginning, lay special emphasis on preventive work.

- "As much medical relief and preventive health care as possible should be provided to the vast rural population of the country. Health services should be placed as close as possible to the people in order to ensure the maximum benefit to the communities to be served.
- "Health consciousness should be stimulated by providing health education on a wide basis as well as by providing opportunities for the individual participation in local health programmes. Development of health schemes should be entrusted to Ministers of Health enjoying the confidence of people.
- "The doctor of the future should be a social physician protecting the people and guiding them to healthier and happier life.
- "The training of the basic doctor should be designed to equip him for such social duties.
- "The large amount of preventible suffering and mortality in the country is mainly the result of an inadequacy of provision in respect of certain fundamental factors, like environment conducive to healthful living, adequate nutrition, health protection to all members of the community irrespective of their ability to pay for it and the active co-operation of the people.
- "The extent of provision of hospitals and dispensaries in rural areas has been considerably less than the urban.
- "Any expenditure of money and effort on improving the national health is a gilt-edged investment yielding immediate and steady returns in increased productive capacity.
- "Suitable housing, sanitary surroundings and a safe drinking water-supply are pre-requisites of a healthy life.
- "Under the conditions existing in the country, medical service should be free to all without distinction and the contribution from those who can afford to pay should be through the channel of general and local taxation. It will be for the Governments of the future to decide ultimately whether medical service should remain free to all classes of people or whether an insurance scheme would be more suitable.
- "For ensuring adequate health service for the vast rural population of the country and for overcoming the difficulty experienced in the past in attracting medical practitioners to the countryside, the most satisfactory method of meeting the situation would be to provide a whole-time salaried service, thus enabling Governments to ensure that doctors are made available where their services are most needed."

The Short-term programme of the Bhor Committee

Personal and impersonal health services should be provided. A Province-wide organisation for a combined preventive and curative health work will be provided by the establishment of a number of primary, secondary and district health units and special health services for mothers and children, school children and industrial workers, which will deal also with the more important diseases prevalent, such as, malaria, tuberculosis, venereal diseases, leprosy and mental diseases. The impersonal health services will include town and village planning, housing, water-supply, drainage and general sanitation.

A progressive improvement of public health depends largely on the promotion of the hygienic mode of life among the people.

In each village a Health Committee consisting of 5 to 7 individuals should be established for procuring the active participation of the people in the local health programme.

The bed-population ratio should be raised from 0.24 per 1,000 to 1.03 at the end of 10 years.

Dental sections should be established in the hospitals at Secondary Health Centres. Provision should also be made for travelling dental units for service in rural areas.

Provision of housing accommodation for health staff was essential in the interests of efficiency.

Village communications should be developed in order to enable health organisations to provide efficient service. For each 30-bedded hospital there should be 2 motor ambulances and 1 animal-drawn ambulance.

Travelling dispensaries should be provided to supplement the health services rendered by primary health centres in sparsely populated areas.

The Long-term programme of the Bhor Committee

The smallest administrative unit will be the primary unit serving an area with a population of about 10,000 to 20,000. About 15 to 25 primary units will together constitute a secondary unit. At the primary, secondary and district health units there will be a health centre as the focal point for radiating different types of health activity.

The objectives to be kept in view after the first 10 years should be as follows :—

- (i) raising of hospital accommodation to 2 beds per 1,000 of population,

- (ii) creation of 12 new medical colleges in addition to the 43 to be established during the first 10 years,
- (iii) establishment of 100 training centres for nurses, and
- (iv) training of 500 hospital social workers.

Nutrition

Improved nutrition plays a vital role in preventing sickness and promoting positive health. Food planning should have, as its objective, the provision of an optimum diet for all.

Eight ounces of milk per day should be included in the average Indian diet. Expectant and nursing mothers and children upto 14 years will need much more.

For improving the diet of people there should be an increase in milk production to the extent of at least 110 per cent.

There are great opportunities in India for developing the fish industry. Immediate investigation should be made of the possibility of producing food yeast on a large scale in India.

Different vitamins should be produced in India and provision should be made for storage, transportation and distribution of food, particularly, perishable articles such as milk, fish and fruit.

Health Education

Health education must promote health and health consciousness and these are best achieved when health practices become part of an individual's daily life.

The instruction of school children in hygiene should begin at the earliest possible stage. The responsibility for health education of the general population should rest on the health departments of Governments. Health Publicity Bureaux should be constituted for this purpose.

Physical Education

There should be one or two physical training colleges in each Province. The National Physical Education Programme should include indigenous games, sports and folk dances.

Health Services for Mothers and Children

Measures directed towards a reduction of sickness and mortality among mothers and children must have the highest priority in the health development programmes.

School Health Services

The functions of a school health service should be :

- (1) preventive and curative health measures including detection and treatment of defects and creation and maintenance of hygienic environment in and around the school, and
- (2) measures for promoting positive health by improvement of the nutritional state of the child by physical culture and by health education.

Occupational Health including Industrial Health

Over and above the general provision for health protection which the worker can share with the other members of the population, special measures should be taken to counteract the adverse effects associated with his occupation.

HEALTH SERVICES FOR THE IMPORTANT DISEASES

For the successful control of malaria it is necessary to set up an adequately staffed permanent malaria organization in each Province, the activities of which will be linked up with those of a Central Organization.

Malaria

The staff of the Malaria Institute of India should be strengthened. A number of malaria control units should be established in provinces, each under a Medical Officer specially trained in anti-malaria work.

Quinine and other anti-malarial drugs should be produced with the aim of keeping the price sufficiently low and making them available to all on an equitable basis. There should be no delay in the production and supply of such drugs.

Tuberculosis

The incidence of the disease is higher in urban and industrial areas than in rural regions. There is, however, a tendency for tuberculosis to spread to the countryside owing to the migration of labour population between industrial and rural areas.

Factors such as malnutrition, under-nutrition, insanitary and overcrowded housing, contributed their share to the increase of tuberculosis.

Provision is required for the isolation and treatment of infective cases. Therefore, a comprehensive integrated service for tuberculosis

should have (a) a domiciliary service, (b) clinics, (c) hospitals, (d) after-care colonies, (e) homes for the incurables and (f) certain ancillary services.

Smallpox

Primary vaccination and re-vaccination should be made compulsory throughout the country. There should be uniformity in the various Provinces in regard to the training given to vaccinators, the methods of their recruitment and their conditions of service.

In the areas where primary health centres are to be established vaccination against smallpox should be one of the normal functions of Public Health Inspectors, Public Health Nurses and Midwives.

In the areas outside the rural health centres an intensive vaccination campaign against smallpox should be organised and improvement in the training and the conditions of service of vaccinators should be made.

Cholera

Permanent and temporary measures required for the control of this disease should be undertaken, such as provision of protected water supply, satisfactory disposal of nightsoil, hygienic control over the production, distribution and sale of food, isolation and treatment of patients, disinfection of infective material and immunization of the people by anti-cholera inoculation.

Special measures for safeguarding the health of pilgrims should be carried out on a wide scale.

Plague

The measures against this disease should mainly be directed against the rat, whose population should be kept down and their systematic destruction by various methods should be undertaken in endemic centres of plague.

Leprosy

Provincial leprosy organisations should be created; institutional treatment of out-patients and in-patients should be provided in a greater degree; isolation colonies should be developed; financial help should be given to voluntary organisations engaged in anti-leprosy work and a Central Leprosy Institute should be established for the training of leprosy workers, the active promotion of research, and the development of an information service.

Veneral Diseases

Free and confidential treatment to all persons suffering from venereal diseases, adequate facilities for the diagnosis of V.D., creation and maintenance of follow-up service and educational work among the people in regard to the disease should be provided for.

Hook-worm

Provision should be made for nightsoil conservancy in rural and urban areas for the purpose of controlling hook-worm.

Filariasis

Adequate control measures should be undertaken to secure an effective reduction in the mosquito population.

Guinea-worm

In the affected areas step wells, tanks and other sources of contaminated water which are responsible for the infection should be treated with lime in order to sterilise them.

Cancer

Provision should be made for radium and X-ray treatments at all hospitals associated with medical colleges. A considerable extension of diagnostic facilities will be necessary.

Mental Diseases

Hospital beds for mental diseases and mental deficiency should be considerably increased. Mental health organisations should be created at the centre and in the Provinces under the Directorates of Health Services.

Training in mental health should be given both in India and abroad to medical men and ancillary personnel.

A Department of Mental Health should be established at the All India Medical Institute. A course for diploma in psychological medicine should be instituted in all Universities.

Environmental Hygiene

Legislation should be enacted in all provinces on a uniform basis including within its scope both urban and rural areas, in order to regulate town and village planning.

Town and Village Planning

Improvement Trusts should be established in all the larger cities of the country for dealing with slum clearance and rehousing problems.

The haphazard location of industries in inhabited areas must be controlled by proper legislation.

Housing

A long-term policy is required for the satisfactory solution of the housing problem in India. Hygienic houses in sufficient numbers and in sizes which will be adequate should be the objective.

Water-supply

A water-supply programme should be immediately adopted by Governments with the aim of providing the entire population of the country with safe supply of water for drinking purposes within a period of about 35 years.

Quarantine

The Central Government should enforce all measures necessary for the purpose of internal quarantine.

Vital Statistics

Vital statistics are incomplete, inaccurate and faulty. The present system should be radically revised.

Public Health Personnel

The post-graduate education now provided through the Diploma in Public Health should be mostly incorporated in the course of training for the under-graduate; and post-graduate training in preventive and social medicine should provide for advanced training in such branches as malariology, maternity and child welfare, industrial hygiene, public health administration, epidemiology, public health laboratory practice and statistics.

The training of Public Health Engineers should occupy a definite place in the course of studies provided at the different engineering colleges. Public Health Inspectors and Public Health Laboratory Workers should also be trained.

Nurses, Midwives and Dals

The unsatisfactory conditions of training and service of nurses should be remedied.

Nursing colleges should be established to provide 5-Year Degree courses in nursing. Male nurses and male staff nurses should be trained and employed in large numbers in male wards and male out-patient departments.

In the training of public health nurses special emphasis must be laid on the preventive aspect.

The continued employment of dais will be inevitable for some time and a scheme of practical training should be evolved in order to make the most effective use of such persons.

Biological Products

The production of vaccines and sera, which is of paramount importance to the public health authorities in protecting the people against epidemics, should be a Government responsibility.

All India Medical Institute

A few institutions which will concentrate on the production of highly qualified health personnel should be established in different parts of India. One such training centre should be the All India Medical Institute at Delhi.

Professional Education

At the end of first 10 years the production of doctors should be at the annual rate of 4,000 to 4,500. To man the new medical colleges with suitable teachers the All India Institute should provide a steady stream of teachers of a high quality. Besides, selected persons should be sent abroad for training in order to fill up the teaching posts in the country.

It would be to the ultimate benefit of the country if in the training of doctors the aim was concentrated on the production of only one type of physician and that of the highest type.

Only students who are best qualified to make use of the opportunities provided in medical colleges should be admitted, although other considerations cannot be entirely ignored in the present stage of the country's development. Reservation for suitable women candidates will also have to be made.

All those who are willing to enter the public services after successfully completing their medical and nursing courses should be given stipends.

Medical Education

Undergraduate Education

There should be a re-organisation of the teaching in the pre-clinical and clinical fields; a reduction in the hours of didactic instruction in certain subjects; an emphasis on the inclusion of methods which

will enable students to learn for themselves; the establishment of a Department of Preventive and Social Medicine in every college; the inclusion of one year of internship of which three months should be devoted to work in a public health unit; the stressing of the importance of research by wholetime teachers being engaged in it and by encouragement of students showing aptitude for research; the expansion of facilities in existing colleges; the conversion of medical schools into colleges; and the establishment of new colleges.

Post-graduate Education

Post-graduate education should be so devised as to provide for the training of consultants and specialists and the training of practitioners desirous of practising a speciality.

A special organisation called the Central Committee for Post-graduate Education should be established and made responsible for laying down standards in respect of post-graduate training in particular subjects.

There should be refresher courses for general practitioners. A special condensed MBBS course should also be given to licentiates serving in the armed forces etc.

Dental Education

Provision should be made in medical and dental colleges for training dental surgeons, dental hygienists and dental mechanics. Suitable legislation for compulsory registration of dentists and prohibition of practice by unregistered dentists should be enacted on an all-India basis.

Pharmaceutical Education

Educational facilities for licentiate pharmacists, graduate pharmacists and pharmaceutical technologists should be provided.

Medical Research

A statutory Central Research Organisation should be constituted with a Scientific Board and an Administrative Body forming a link between the Board and the Government. Provision of laboratory services in different provinces was also recommended. Development of research in special subjects like malaria and nutrition was suggested.

The primary requirement for research was an increase in the number of properly trained research workers.

Drugs and medical requisites

The question of the requirements of the country of drugs and other medical requisites should be examined by a small committee. The Drugs Act of 1940 should be brought into operation throughout the country and rigidly enforced.

Population Problem

Limitation of families through self-control may not be feasible. Therefore birth control through positive means is the only method which is likely to be effective. As part of the study of the population problem in India, the part which heredity and environment play in the transmission of valuable human traits and of defects should be investigated.

3. Developments that have taken place since the Bhore Committee's Report

Since the publication of the report of the Health Survey and Development Committee many outstanding events have occurred both in the national and international spheres—events which have had profound impact on all problems of administration and in particular on problems connected with health and medical relief.

The most important of these, undoubtedly, is the attainment of Independence by India on the 15th August 1947, whereby the responsibility for the Government of this country has fallen on Indian shoulders completely, and the care of the health and welfare of the citizens of India rests on the people of the country through the Governments set up in the States and in the Centre. It is also to be noted that on the 26th of January 1950 the Constitution of India came into force and India became a Republic in the Commonwealth. The impact on health problems caused by the adoption of the Constitution in 1950 and the responsibilities of the States and Centre in the sphere of national activity will be referred to in greater detail later.

Reference should be made to the partition of India consequent on the attainment of independence, whereby some of the provinces which were formerly in what was known as British India became separated to constitute Pakistan. Soon after partition a great change took place in India whereby the Princely States were merged into the Provinces of India, so that the demarcation that was so obvious at the time when the Bhore Committee considered questions of health, did not continue. It will be recalled that the Bhore Committee confined its activities to British India and did not take into consideration the conditions of health that prevailed in what was termed as the Princely States. This was a serious drawback as in many respects the conditions prevailing

in some of the Princely States were very different from those in the provinces of British India. On Independence Day there were 9 British Indian Provinces and 600 Princely States. 216 States were merged in neighbouring Provinces, 61 were constituted into 10 Centrally Administered Units and the remaining 275 States were integrated to create 5 new administrative units. At the time the Princely States were merged with India, the States and Provinces were classified into three categories as Parts 'A', 'B' and 'C'.

Subsequently the States were reorganised and excepting for a few centrally administered areas, now all the States are governed by the same Constitution and in a uniform pattern. As a result of the partition of India, it has been stated that an area of about 365,000 square miles with an estimated population of 88 millions has been separated from the Indian Republic. As against this, the integration of the Princely States has added to the area of the old territory of British India 7,16,000 sq. miles and an estimated population of 93.2 millions. The population according to the census of 1961 is estimated at 436 millions in India. These are important political and geographical changes that have taken place since the days of the Bhore Committee. It naturally follows that the health problems of the country can now be considered in their totality and measures suggested should therefore be applicable to every part of India.

It will be relevant to mention another important change that has taken place since the time the Bhore Committee submitted its recommendations, and that is the abolition of the Indian Medical Service in August, 1947. Most of the highest administrative and specialists posts in the States were manned by officers of the Indian Medical Service, the Women's Medical Service and the Medical Research Department who were officers of an all-India cadre, thus providing a certain measure of co-ordination between the Centre and States in spite of the fact that 'Health' was a 'transferred subject' under the Government of India Act, 1935. The change had a certain centrifugal tendency in the sphere of health administration. The establishment of the Central Council of Health with Health Ministers of States as members was intended to promote a co-ordinated approach to health policies and problems. This subject has been dealt with in more detail in the chapter on Administration.

The Planning Commission and the Five-Year Plans

The establishment of the Planning Commission in 1950 and the introduction of planned methods for the development of India was an event of great significance. The First Five Year Plan of 1951-56 and the Second Five Year Plan provided Rs. 140 crores and Rs. 274 crores

respectively for the health development schemes, apart from sums provided by the Centre and the States for their normal health activities.

The First Five Year Plan was a modest step towards development in the future. In setting apart a sum of Rs. 140 crores for health out of the total plan outlay of Rs. 2,356 crores, the Planning Commission made a statement of the objectives of the First Five Year Health Plan in the following words :

- (i) Provision of water supply and sanitation.
- (ii) Control of malaria.
- (iii) Preventive health care of the rural population through health units and mobile units.
- (iv) Health services for mothers and children.
- (v) Education and training, and health education.
- (vi) Self-sufficiency in drugs and equipment.
- (vii) Family planning and population control.

The break-up of the provision for health was as follows :—

		In crores Rs.
Water supply and sanitation (rural and urban)	..	49.00
Primary health units, hospitals and dispensaries	..	25.00
Control of communicable diseases	.. ..	23.10
Education, training and research	.. ..	21.60
Indigenous systems of medicine (including Homoeopathy and nature cure)	.. ..	0.40
Family planning	.. ..	0.70
Other schemes	.. ..	20.00
		<hr/>
Total	..	140.00
		<hr/>

The actual expenditure was of the order of Rs. 101 crores i.e. 72.14%.

"Health" was allocated Rs. 225 crores out of the total plan outlay of Rs. 4,500 crores in the Second Five Year Plan.

The distribution was as follows :

				In crores Rs.
Water supply and sanitation (rural and urban)	..			76.00
Primary health units, hospitals and dispensaries	..			36.00
Control of communicable diseases	..	..		64.00
Education, training and research	..	..		36.00
Indigenous systems of medicine (including Homoeopathy and nature cure)	..	..		4.00
Family planning	..	..	..	3.00
Other schemes	..	..	..	6.00
				<hr/>
Total	..			225.00
				<hr/>

It is expected that expenditure will be to the extent of 90% of the amount allocated.

The corresponding figures for the Third Five Year Plan are as follows :

				In crores Rs.
Water supply and sanitation (rural and urban)	..			105.3
Primary health units, hospitals and dispensaries	..			61.7
Control of communicable diseases	..	..		70.5
Education, training and research	..	..		56.3
Indigenous systems of medicine (including Homoeopathy and nature cure)	..	..		9.3
Family planning	..	..	..	27.0
Other schemes	..	..	..	11.3
				<hr/>
Total	..			341.9
				<hr/>

The total plan outlay in the public sector is Rs. 8,000 crores. The Third Five Year Plan has as its objectives :

- (i) improvement of environmental sanitation, especially rural and urban water supply ;
- (ii) control of communicable diseases ;
- (iii) provision of adequate institutional facilities to serve as basis for organising health services ;

- (iv) provision of facilities for the training of medical and health personnel;
- (v) public health services including maternal and child welfare, health education and nutrition, and
- (vi) family planning.

As a result of the plan activity in the last decade, it may be justifiably claimed that training facilities have been considerably expanded, although still well below the optimum; the institutional facilities, general and specialised, for the treatment of the sick have been augmented and improved, the ravages of malaria have been substantially controlled; the groundwork for the fight against smallpox, tuberculosis, leprosy and filariasis has been laid and the incidence of communicable diseases in general has been reduced; the framework for planning and developing a national water supply and sanitation programme has been brought into existence and a movement for family planning on a mass scale has been set in motion. In general the infantile and maternal mortality rates have been reduced.

It may be mentioned in this connection that while the outlay on health represented 5.9% of the total outlay in the First and 5% in the Second Plan, only 4.25% of the total outlay is earmarked for health in the Third Plan. This has been fixed in spite of the strong recommendation of the Central Council of Health that 10% of the total Third Plan outlay should be allotted for 'Health'. This has inevitably resulted in substantial reduction in the provision for medical relief, medical education and training programme and for reorganisation of health services. Large scale increases in water supply, drainage and other public health schemes have had to be postponed or curtailed.

It is necessary to mention here another significant change that has taken place, which has a substantial bearing on rural health, viz. the Community Development Programme and the N.E.S. movement. The shifting of the emphasis from dependence on outside help to self-help which is the object of the Community Development Programmes and the policy of Democratic Decentralisation recently adopted by Government will place the responsibility for improving health conditions in rural areas in the hands of the people themselves through the Panchayats, although a cautious approach in the matter seems to be called for.

4. Progress made in the implementation of the recommendations of the Bore Committee

We shall now give a general idea of the programmes implemented during the last decade which may be said to be sequential to the recommendations of the Bore Committee.

Primary Health Centres

77 Primary Health Centres, each covering a population of 60,000 were set up in N.E.S. Blocks in the I Plan period. This programme was continued in the II Plan and the total number of centres established upto the end of February 1960 was 2,013. It was anticipated that by the end of the II Plan period, there would be 2,800 primary health centres.

Hospital accommodation

The number of hospitals and dispensaries has increased from 7,400 to 12,000 i.e. from a ratio of 1:40,000 to 1:33,000; the number of beds increasing from 11,300 to 18,500 corresponding to an increase from 0.24 to 0.4 per thousand.

Nutrition

In the field of nutrition the important developments have been the setting up of Nutrition Research centres at Bombay and Calcutta, courses in Nutrition in the All India Institute of Hygiene and Public Health, Calcutta, establishment of the Central Food Technological Research Laboratory at Mysore, transfer of the Nutrition Research Laboratory from Coonoor to Hyderabad and its expansion, creation of the Central Food Laboratory at Calcutta, passing of the Prevention of Food Adulteration Act and formulation of Rules thereunder, training of nutrition workers and lastly the establishment of a National Nutrition Advisory Committee in accordance with the recommendations of the F.A.O.

Health Education

In this field may be mentioned the creation of the Central Health Education Bureau and State Bureaux, production of health education material and training of personnel.

Maternal and Child Health

More than 3,500 maternal and child health centres were started in this period. There has been a fairly large increase in the maternity and paediatric bed-strength. The strengthening of the administrative machinery in the States and the Centre, the creation of the Colleges of Nursing for degree courses, the training of a large number of health visitors, midwives and auxiliary nurse-midwives, which is a new scheme for training nurse midwives to meet the shortage of nurses, and the integration of public health nursing in the basic nursing course, were some of the other noteworthy developments in this field.

School Health and Feeding of School Children

Certain States have carried out the school health programmes to a limited extent. Mid-day meals programmes for school children have been launched in some States.

Malaria

Progress in regard to malaria has been very notable. The National Malaria Control Programme was inaugurated in 1953 in co-operation with the Technical Co-operation Mission of the United States and technical advice of the World Health Organisation. By the end of 1957-58, 193.5 units, each covering one million population were in operation. In 1958-59 the National Malaria Control Programme was converted into the National Malaria Eradication Programme. During 1960-61 besides spraying operations in 390 units, surveillance operations were instituted in 365 units. This new concept of malaria eradication, which was not contemplated in the Bhore Committee Report, reduced proportional case rate of malaria to other diseases from 10.8 per cent in 1953-54 to 2.88 per cent in 1959-60.

Tuberculosis

Mass B.C.G. vaccination was undertaken. About 167 million persons have been tuberculin tested and about 60 million vaccinated by about 170 teams working in the various States. 140 T.B. clinics have been functioning. Three Demonstration and Training Centres have been established. The number of T.B. beds has increased from 6,000 to 30,000. The National Tuberculosis Institute has been established in Bangalore to undertake training and research.

Leprosy

Under the Leprosy Control Scheme, treatment and study centres and subsidiary centres were established. The scheme provides for facilities for advanced cases, aftercare and rehabilitation training of leprosy workers and setting up of out-patient clinics etc. A Central Leprosy Teaching and Research Institute was established at Thirumani near Madras to undertake research. Voluntary organisations have played a significant role in this field and new organisations have helped in expanding the scope of anti-leprosy work.

Trachoma

Important work was done by the Trachoma Pilot Project in Aligarh which has laid the foundation of anti-trachoma campaigns in Uttar Pradesh, Rajasthan, Bihar and Madhya Pradesh.

Goitre

A Goitre Control project was initiated in the sub-Himalayan areas. Survey units have been working actively and iodised salt was supplied free to the inhabitants of the endemic areas in co-operation with the UNICEF. An iodised salt plant has been established in the Sambar Lake area.

Venereal Disease

The development in this field includes the setting up of Headquarters and District Clinics, the establishment of a V.D. Training Centre at New Delhi, the upgrading of the V.D. Department of the Madras General Hospital, the manufacture of V.D.R.L. Antigen at a Unit set up at Calcutta, the production of PAM at Pimpri and the mass V.D. campaigns in Himachal Pradesh and Kulu Valley.

Cancer

Two cancer research centres were set up by the Government of India, one at Bombay and the other at Calcutta. In addition, certain non-governmental cancer institutions were given substantial financial help.

Mental Health

Mention may be made of the establishment of the All India Institute of Mental Health at Bangalore, which provides for research, post-graduate studies and training of mental health workers. Government also took over the Ranchi Mental Hospital. A small number of child guidance clinics were added to the psychiatry departments of certain teaching hospitals.

Water Supply and Sanitation

Under the National Water Supply and Sanitation Scheme, the Central Government gave long-term loans and subsidies to State Governments for their urban and rural water supply schemes. Loans were also given to the bigger Corporations for water supply schemes. At the close of the II Plan period 13 million additional population in urban areas had the benefit of protected water supply and 3 million had drainage facilities. In the rural sector this scheme has benefitted 16 million people. The establishment of one Central Public Health Engineering Organisation at New Delhi as part of the Directorate General of Health Services and of another Central Public Health Engineering Research Institute at Nagpur by the Council of Scientific and Industrial Research, is an important development. The Central Government have also implemented a scheme for the training of Public Health Engineers and allied personnel at Calcutta, Roorkee and Madras.

Medical Education

The expansion in the field of medical education has been remarkable. As against 43 medical colleges visualised by the Bhoré Committee at the end of the first decade after their Report, there are today actually 61 medical colleges in the country with an annual admission of about 5,900. All medical schools except one which were training medical personnel upto the licentiate standard have been converted into medical colleges awarding the MBBS degree. 13 selected departments of some medical colleges have been upgraded with assistance from the Central Government. Departments of Preventive and Social Medicine have been established in almost all the medical colleges. Three new dental colleges have been established and dental wings added to medical colleges. Facilities for post-graduate studies and dental surgery have also been made available. The All India Institute of Medical Sciences has begun functioning since 1956. An Armed Forces Medical College for higher training of defence personnel has been established at Poona.

Family Planning

The declared policy of the Government of India is to reduce the rate of population growth in order to raise the standard of living and to ensure health, happiness and fuller family life. In the First Plan a four-fold action-cum-research programme was launched, followed by service, training, education and research programmes in the Second Plan period. A Central Family Planning Board, a Standing Committee, a Demographic Advisory Committee and a Committee on Physiology of Human Reproduction were set up. A net-work of urban and rural family planning clinics has been established. A significant feature is the increasing popularity of sterilisation by the people, as a part of this programme. Efforts to make the country self-sufficient in contraceptives are being made. Training of instructors has been undertaken in several places. Testing of contraceptives is done at two centres. Research connected with Family Planning activity is also being carried on vigorously.

Indigenous Systems of Medicine

The Government of India have given financial assistance for the development of Ayurveda, Siddha, Unani, Homoeopathy and Nature Cure, particularly for research. The Institute of Research in Indigenous Systems of Medicine and the Post-graduate Training Institute in Ayurveda, both at Jamnagar, may be mentioned in particular.

Drugs & Medical Stores

The drug industry in the country has made great progress. Machinery for the enforcement of the Drugs Act in regard to the

manufacture, sale and distribution of drugs and medical stores has been set up in all States and in the Central Government. The Pharmacy Act and the Drugs and Magic Remedies Act have been passed. The Central Drugs Laboratory has also been set up.

5. Changes in regard to Health Administration consequent on the adoption of the new Constitution

The Union of India is a Federation consisting of a number of States bound together by the provisions of a Constitution which has given specific powers to individual States and to the Federal Authority, viz. the Central Government.

The Government of India Act of 1935 introduced for the first time the three Lists, viz. Union List, State List and the Concurrent List. The framers of the present Constitution retained this principle of three Lists and, although some changes were incorporated, the general pattern of distribution of functions under these Lists has remained largely the same as that of the 1935 Act.

The three Lists are enumerated in the Seventh Schedule of the Constitution, as List I (Union List), List II (State List) and List III (Concurrent List). Parliament alone has the right to legislate in respect of subjects in List I, State Legislatures have the exclusive right, except under certain conditions, to make laws regarding matters in List II, and in regard to List III, Parliament and the Legislature of a State may make laws. Further all residuary powers of legislation are vested in Parliament, that is, Parliament has the exclusive power to legislate on any matter not enumerated in the Concurrent List or State List, including the power of making laws imposing a tax not mentioned in either of these two lists.

Parliamentary legislation on a subject in the State List is permissible under three different sets of conditions :

(a) Under Article 249, if the Council of States declares by a two-thirds majority vote that it is necessary or expedient in the national interest that Parliament should make laws in respect of any matter enumerated in the State List, Parliament can legislate on the matter, subject to the limitation that the law so made remains in operation during the period when the resolution of the Council of State remains in force ; this period cannot exceed one year on each occasion, although it is permissible to extend its operation year by year by successive resolutions. After the lapse of six months from the termination of operation of such a resolution, the Parliamentary law so passed will cease to be in force.

(b) Under Article 250 of the Constitution, Parliament can legislate on any subject in the State List for the whole or any part of India, while a Proclamation of Emergency is in operation, the maximum period for such law being the period for which the emergency lasts and six months beyond.

(c) A third type of Parliamentary legislation on subjects included in the State List is under Article 252 ; if the legislatures of two or more States pass a resolution suggesting Parliamentary legislation on any matter included in the State List, then it is lawful for Parliament to make laws regulating that matter ; and such laws can be extended to any other State as and when the Legislature of that State passes a resolution to the same effect ; an amendment or repeal of such law can be done only by Parliament ; the initiative for promoting legislation of this kind and for its amendment or repeal has, however, been left in the States, the intention being that, when the conditions necessitating such a law cease to exist or become modified, it should be possible for the States to ask for appropriate action and for Parliament to carry out the necessary legislative changes.

It is not easy to determine, in certain cases, whether the functions implied under specific items in each List has a direct or indirect bearing on Health.

Broadly speaking, if a service envisaged under an item is such that it forms a normal health function it seems correct to hold that the item should be shown under the heading 'direct' and, in other cases, as 'indirect'. In respect of some items the functions that are contemplated and the benefits accruing from the exercise of those functions may go beyond the benefits conferred on the community by health services and yet such items may have a bearing on Health as well ; these items are shown under the heading 'indirect'. Examples are the census under the Union List and 'vital statistics and registration of births and deaths' under the Concurrent List. Population data are of great importance to the health department for a number of purposes, such as the organisation of health services in a manner calculated to meet the requirements of the people ; at the same time population figures and estimates are necessary in a variety of fields of public activity, e.g. economic and social planning. Similarly, as the heading 'vital statistics and registration of births and deaths' includes data relating to the incidence of disease as well as births and deaths, the figures thus made available would form the very basis of organised public health activity in the interests of the community ; nevertheless, birth and death data and population studies based on such data have a much wider range of application than that covered by the requirements of a public health administration. Such an item has therefore been placed under the cate-

gory, 'indirect'. These remarks apply to other items also, e.g. modes of transport, railways, ships etc; industry, ports.

UNION LIST

Direct

1. Pilgrimages to places outside India.
(Health functions form the most important part.)
2. Port quarantine, including hospitals connected therewith; Seamen's and marine hospitals.
3. Co-ordination and determination of standards in institutions for higher education or research and scientific technical institutions.
4. Inter-State migration; Inter-State quarantine.

Indirect

1. Shipping and navigation on inland waterways, declared by Parliament by law to be national waterways as regards mechanically propelled vessels; the rule of the road on such waterways.

(In so far as regulation of health requirements and control of infection on such vessels are concerned. A similar relationship to Health exists in other items.)

2. Ports declared by or under law made by Parliament or existing law to be major ports, including their delimitation, and the constitution and powers of port authorities therein.
3. Airways; aircraft and air navigation; provision of aerodromes; provision for aeronautical education and training and regulation of such education and training provided by States and other agencies; regulation and organisation of air traffic and of aerodromes.
4. Carriage of passengers and goods by railway, sea or air or by national waterways in mechanically propelled vessels.

Direct

Indirect

- 5 Establishment of standards of quality for goods to be exported out of India or transported from one State to another (e g control of adulteration)
- 6 Industries, the control of which by the Union is declared by Parliament by law to be expedient in the public interest

(e g enforcement of health requirements for workers, guarding against accidents, provision of creches and other amenities etc)
- 7 Regulation of labour and safety in mines and oil-fields
- 8 Regulation and development of inter-State rivers and river valleys to the extent to which such regulation and development under the control of the Union is declared by Parliament by law to be expedient in the public interest
- 9 Union agencies and institutions for
 - (a) professional, vocational or technical training including the training of police officers , or
 - (b) the promotion of special studies or research

STATE LIST

Direct

1. Public health and sanitation ; hospitals and dispensaries.
2. Pilgrimages, other than pilgrimages to places outside India.

(See remarks under the Union List.)

Indirect

1. Local government, that is to say, the constitution and powers of municipal corporations, improvement trusts, district boards, mining settlement authorities for the purpose of local self-government of village administration.
2. Intoxicating liquors, that is to say, the production, manufacture, possession, transport, purchase and sale of intoxicating liquors.
3. Relief of the disabled and unemployable.
4. Burials and burial grounds ; cremation grounds.
5. Education including universities, subject to the provisions of entries, 63, 64, 65 and 66 of List I and entry 25 of List III.
6. Markets and fairs.

CONCURRENT LIST

Direct

1. Lunacy and mental deficiency, including places for the reception or treatment of lunatics and mental deficients.
2. Adulteration of foodstuffs and other goods.

Indirect

1. Economic and social planning.
2. Social security and social insurance ; employment and unemployment.
3. Vital statistics including registration of births and deaths.

*Direct**Indirect*

- | | |
|--|--|
| 3. Drugs and poisons subject to the provisions of entry 59 of List I with respect to opium. | 4. Ports other than those declared by or under law made by Parliament or existing law to be major ports. |
| 4. Legal, medical and other professions. | |
| 5. Prevention of the extension from one State to another of infectious or contagious diseases or pests affecting men, animals or plants. | |

Our Constitution has made detailed provision designed to avoid serious differences of opinion between the Union and the States in the administrative field, the pattern that was adopted being based mainly on that which had previously been established under the Government of India Act, 1935.

Under Article 256, the Union Government is empowered to give such directions to a State as may appear to be necessary for ensuring compliance with the laws made by Parliament. In addition to this the Constitution provides under Article 257 that no State shall impede or prejudice the exercise of the executive power of the Union in a State. If a Union agency finds it difficult to function within a State, the Central Government is empowered to issue appropriate directions to the State Government to remove all the obstacles.

With the consent of the State Government the Central Government is empowered to entrust to that Government or its officers, functions which fall within the scope of the Union's executive functions. Parliament is also empowered in a similar manner to confer powers or impose duties on State officers in respect of any of its laws for application in the State.

Reference should also be made to Articles 262 and 263 of the Constitution. Under Article 262 Parliament has power to provide for adjudication of any dispute or complaint with respect to the use, distribution or control of the water of, or in, any inter-State river or river-valley, as well as to prevent by legislation, the exercise of jurisdiction by the Supreme Court or any other court in respect of any such dispute or complaint.

Article 263 enables the President to establish, in the public interest, Councils charged with the following duties :

(a) inquiry into and advising upon disputes which may have arisen between States ;

(b) investigating and discussing subjects in which some or all of the States, or the Union and one or more of the States, have a common interest ; or

(c) making recommendations on any subject and, in particular, recommendations for the better co-ordination of policy and action with respect to that subject.

The President may also define the nature of the duties to be performed by the Council and its organisation and procedure.

The Central Council of Health was established under the provisions of this Article.

It is also necessary to point out that the Planning Commission and the National Development Council, of which the Central Ministers and Chief Ministers of the States are members, together constitute two powerful organs to promote a co-ordinated advance in the country over the whole area of national planning and development through successive five-year plans. The large sums of money distributed by the Centre through the Planning Commission to assist the States in the execution of the five-year plans must also facilitate a greater co-ordination of effort by the Centre and the States and the growth of fuller co-operation in the progressive approach that is being made towards a Welfare State.

A study of the legislative and administrative relations between the Centre and the States provided by the Constitution suggests that what has been sought to be achieved is a large measure of unity in policy-making and in execution of policy in the face of a clear demarcation of functions between the Centre and the States. The authors of the Constitution claim that, in its present form, it is a great improvement on the Constitutions of Federations such as those of the United States, Australia and Canada and that a larger measure of control for the Centre, than in the case of the other three countries, has been provided,*in order to meet the difficulties that may arise from time to time. While this is true, it is pertinent to enquire whether the desired measure of cooperation and coordination can be expected to develop in the functioning of the Central and State Governments, especially with large areas of public administration effectively transferred to

the States under the State List. In this connection the following quotations from Paul H. Appleby's "Report of a survey of Public Administration in India" are given below :

"Epidemics respect no State boundaries and for other reasons too national health is increasingly a national problem. Neither agriculture nor fisheries has greater local significance than national if as much. In a nation dedicated to the Welfare State ideal, the food supply and the welfare of farm families are inescapably national responsibilities. Almost all economic activities are carried on in localities but this fact does not make their significance local. The Constitutional effort to specify scopes of national and state powers so precisely would appear to raise the most serious barriers before national needs to develop and execute national programme in the interest of national economy and the national public."

"It is not too unfair, I think, to say that except for the character of its leadership, the new national government of India is given less basic resource in power than any other large and important nation, while at the same time having rather more sense of need and determination to establish programs dealing with matters important to the national interest. The Administrative trend is evidently to go still further to give over to the States some financial resource now in the province of the Centre, to minimize in practice some of the marginal or interpretative zones of power, and to retreat before an opposition State Minister's charge of 'interference' with the States."

"No other large and important national government, I believe, is so dependent as India on theoretically subordinate but actually rather distinct units responsible to a different political control, for so much of the administration of what are recognised as national programs of great importance to the nation."

"The power that is exercised organically in New Delhi is the uncertain and discontinuous power of prestige. It is influence rather than power. Its method is making plans, issuing pronouncements, holding conferences. In reference to two different program fields I have been authoritatively informed at both the Centre and in the States that the Centre's administrative function is performed by annual or semi-annual conferences. Any real power in most of the deve-

lopment field is the personal power of particular leaders and the informal, extra-constitutional, extra-administrative power of a dominant party, coherent and strongly led by the same leaders. Dependence for achievement, therefore, is in some crucial ways, apart from the formal organs of governance, in forces which in the future may take quite different forms."

It is understood that when the question of subjects to be included in the three Lists of our Constitution was under active consideration by the Constituent Assembly, a suggestion was put forward that all the subjects in the State List relating to Health, at least those which have a direct relationship, might be transferred to the Concurrent List, the purpose being that Central legislation might be undertaken so as to provide for uniformity of action over India as a whole, as well as to promote Central guidance and help to the States by the incorporation of appropriate provisions, in the respective Acts, to achieve these ends. It was not pressed for acceptance largely because some of the States did not agree to this suggestion. A similar attempt was made again in 1954 or 1955 but the proposal was again turned down.

Taking the above mentioned facts into consideration it seems certain that recommendations of a less drastic character will alone find favour with the Central and State Governments and that such recommendations, if made, may receive acceptance without delay. Early implementation is a matter of supreme importance; as was mentioned earlier, epidemics and other forms of infectious diseases respect no boundaries, and such diseases form the majority of the causes for the large amount of ill-health and mortality existing in the country. Again, improvement of environmental hygiene, including pure water-supply and proper disposal of human and animal wastes, is essential and advances in this direction also do not brook delay; similar instances requiring prompt and effective action can easily be multiplied. Even partial success achieved in specific areas of health administration will undoubtedly prove to be of definite value; it may also be confidently expected that such success would lead to the growth of a volume of healthy public opinion, which is bound to exercise its influence towards a speeding up of the process of improvement in all directions.

The main areas of administration with which a Health Ministry is concerned are (a) provision of adequate medical care, preventive and curative, (b) the training of medical and para-medical personnel, including those for dental care, and (c) research. All the three areas of development are obviously inter-linked and, taking the country as a whole, it is only through a coordinated programme of action in which the Centre and the States co-operate that satisfactory and speedy results

can be achieved. For this purpose action may perhaps be taken in the following directions :

1. Formation of a Central Health Cadre in which the senior posts in the Central and State Ministries of Health will be included.
2. Extension of the functions of the University Grants Commission to education in the fields of Medicine, Engineering, Agriculture and Veterinary Science.
3. Institution of National Programmes in regard to malaria eradication, small-pox, cholera, leprosy, tuberculosis and filariasis.
4. Making the Central Health Council more effective than at present.

In our opinion therefore, the suggestions that have been made in this report do not necessitate any amendments to the existing Constitution. Most of the suggestions can be implemented if healthy conventions are established and goodwill is available from all concerned. Legislation of a penal nature can never do good so far as health reforms are concerned, and it is therefore necessary in considering these, that more and more co-operation and co-ordination between the Central and State Governments, and between the State Governments themselves should be fostered, and the idea that their interests are separate should vanish. Legislative measures will, however, be necessary in the interests of the public in respect of certain matters relating to health such as food adulteration, adulteration of drugs, certain obnoxious trades and objectionable advertisements. It is much better to educate the public in such a manner as will ensure their full co-operation and will make them realise ultimately what the Governments stand for and how public co-operation will produce the best method for solving any of these problems.

These suggestions can be implemented first on a regional level and then on an all-India level wherever necessary. We are glad to note that regional meetings are being held, of Health Ministers, the Directors of Medical Services and others concerned with Health, and we believe that such meetings will be fruitful, provided everybody realises the importance of co-operative effort which is much more vitally needed in matters of health than in other fields of activity.

CHAPTER III

ROLE OF INTERNATIONAL ORGANISATIONS

- (1) World Health Organisation
- (2) U.N.I.C.E.F.
- (3) Colombo Plan
- (4) Technical Co-operation Mission
- (5) Rockefeller Foundation
- (6) Ford Foundation
- (7) F.A.O.
- (8) Russian Aid
- (9) Norwegian Aid
- (10) CARE
- (11) Other Countries

CHAPTER III

ROLE OF INTERNATIONAL ORGANISATIONS

While the national events that have been referred to in the previous chapter have certainly been of tremendous importance from the health point of view, certain international events have also had very great impact on conditions of health prevailing in many countries.

Before the conclusion of the II World War some of the important powers decided to set up an organisation for the purpose of more effectively consolidating the forces for order and for the prevention of any likely recrudescence of the unfortunate trends that led to the II World War. As a result of an appeal by the four great powers Britain, France, U.S.A. and the Union of Soviet Socialist Republic, a conference was held in 1945 at San Francisco and an Organisation called the United Nations emerged therefrom.

It is significant that one of the first acts of the United Nations Organisation through its Economic and Social Council was a resolution adopted for the constitution of a World Health Organisation as one of the specialised agencies of the United Nations. The activities of this Organisation are now well-known throughout the world and the influence it has exercised on many problems of health in different countries has materially helped in the tackling of some of the major and urgent problems on a global scale.

The other notable international agencies which have given substantial aid to India in the field of health are the UNICEF, Technical Co-operation Mission of the U.S., Rockefeller Foundation, Ford Foundation, F.A.O. and CARE.

The amount of aid received by India from these agencies has been indicated in Appendix IV.

We may now give a brief resume of the work of some of these international organisations.

1. World Health Organisation

The W.H.O. is one of the specialised agencies of the United Nations and came into being in 1948. This organisation has more than 100 member-States, which collaborate in the task of achieving the highest possible level of health throughout the world. The W.H.O. deals with problems of health like malaria, smallpox, cholera, plague,

yellow fever and other communicable diseases which have an international as well as a national impact. Advice and assistance are given to countries requesting for such help in the field of maternal and child health, nutrition, environmental sanitation, professional education, nursing, health, education of the public, mental health etcetera.

The origin of the WHO may be traced back to the International Sanitary Conference held in Paris in 1851 which aimed at an agreement between a number of nations on maintaining quarantine requirements thus ensuring adequate safeguards to public health. This agreement resulted in the International Sanitary Convention of 1852. The first International Sanitary Conference was followed by the Second in 1859, the third in 1866, the fourth in 1874, the fifth in 1881, next in 1885, 1892, 1893, 1894 and 1897. All these aimed at the prevention of epidemic diseases like cholera, plague and yellow fever. The International Sanitary Conference of 1903, made a more positive approach towards public health and hygiene than the earlier conferences. This led to the establishment of the OIHP (Office International d'Hygiene Publique) whose function was generally to disseminate to Member-States information of public health interest, particularly in regard to cholera, plague, and yellow fever and measures to combat these diseases. The OIHP formed the forum for the discussion of scientific problems by the leaders of public health in different countries. Important developments in medical and public health fields took place. There was not as yet the sharp distinction between the medical scientist and the public health administrator. The International Sanitary Convention of 1903 underwent a number of changes. Then with the outbreak of World War I there was a lull in the activities of OIHP. New ideas had meanwhile entered the minds of public health administrators. From being purely an international security agency against disease by setting up barriers against communicable diseases, the powers that be realised the importance of maintaining standards of health in individual nations. With the advent of the League of Nations, it was considered that this should be a central organisation through which all international activities, including those relating to health, should be co-ordinated and that there should be a Technical Health Committee of the Council of the League for this purpose. Although the original intention was that the OIHP should merge with the League Health Committee these two bodies continued independently for a number of years. The OIHP was as usual engaged in the periodical revision of the International Sanitary Convention, while the Health Committee of the League sought opportunities for useful work by new methods and on new subjects. With the outbreak of World War II, the OIHP practically ceased to function and its functions were taken over by the Health Division of the UNRRA (United Nations Relief and

Rehabilitation Administration). Mention has to be made of the development of certain important regional health bodies like the Pan American Sanitary Bureau side by side with the OIHP whose contributions to international health were noteworthy. The United Nations Conference on International Organisation held at San Francisco in 1945 decided to include 'health' in the Charter of the United Nations since "medicine" was one of the pillars of peace. The Economic and Social Council of the U.N. took further action on this decision in 1946 and called for proposals for the establishment of a single international health organisation of the United Nations. The first International Health Conference held in June 1946 passed the Constitution of the WHO and appointed an Interim Commission to make preparations for the First World Health Assembly, and to take on and carry out the functions of the earlier international health organisations. The World Health Organization was thus established in 1948.

The Constitution of the WHO defines "Health" as a "state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" and goes on to say that one of the fundamental rights of every human being without distinction of race, religion, political belief etc. is the enjoyment of the highest attainable standard of health. The objective of the WHO being the "attainment by all people of the highest possible level of health", its functions are described *inter alia* as :

- (a) a co-ordinating authority on international health work ;
- (b) assisting Governments in strengthening their health services ;
- (c) giving technical assistance and other aid ;
- (d) stimulating work on the eradication of epidemic, endemic and other diseases ;
- (e) improving nutrition, housing, sanitation ;
- (f) promoting maternal and child health ;
- (g) fostering activities in the field of mental health, especially those affecting the harmony of human relations ;
- (h) promoting research ; and
- (i) developing informed public opinion on health matters.

It should also be noted that the WHO Constitution provides for effective collaboration with other specialised agencies of the U.N., governmental health administrations and professional and scientific groups, all for the advancement of health.

Under Art. 44 of the WHO Constitution, the World Health Assembly was empowered to create regional organisations in well-defined geographic areas to meet the special needs of those areas. The First World Health Assembly considered this matter and decided to establish regional organisations in six areas. It may be noted that the first regional organisation to be set up was for S. E. Asia with headquarters at New Delhi. The S. E. A. Regional Office of the WHO started functioning on 1st January 1949. India, Afghanistan, Nepal, Burma, Ceylon, Thailand and Indonesia are served by the S. E. A. Regional Office.

The World Health Assembly has met fourteen times so far. Incidentally it may be mentioned that India had the privilege of being the host country for the Fourteenth World Health Assembly. India has played a prominent part in the proceedings of the World Health Assembly, the Executive Board of the W.H.O. and the various Expert Committees of that organisation. Representatives of India have so far held the Presidentship and Vice-Presidentship of the World Health Assembly on two occasions each. The Indian Delegate has been the Chairman of the Executive Board, besides holding the Chairmanship of the Standing Committee and the Committee on Administration and Finance.

In order to ensure the most effective use of its resources, the WHO have laid down the following criteria for selection of projects :

1. The programmes should be long-range and internationally feasible ;
2. The country asking for help should be able to participate in the work and continue it after WHO aid is withdrawn ;
3. The programme should benefit the largest possible number of countries and people ;
4. The necessary qualified staff should be available ;
5. Any work already done in the particular field should be taken fully into account.

The methods of work that have been developed by the WHO may in general be classified as follows :

(a) Contribution to the world's technical resources for health work by services ;

(b) Direct help and guidance in organising particular aspects of plans of countries desiring to provide better health services to their peoples ;

(c) Development of projects in a country by a WHO expert advisory team in close collaboration with the national health authorities.

(d) Local Demonstration projects as part of a country's programme in which local staff work as understudies and later when the WHO demonstration team withdraws, the local staff can continue the work of the project.

(e) Research ;

(f) Formation of laboratory networks for reference and exchange of information on a variety of subjects.

So far as the S. E. Asia region is concerned, the main health problems have been mal-nutrition, high maternal and infant mortality, high incidence of communicable diseases combined with inadequate sanitation, shortage of all types of technical personnel in the health field and practically non-existent public health services except in a few urban centres. In the early years of its existence the S. E. Asia Regional Office of the WHO limited its work to short-term demonstration and training projects in collaboration with local resources, and to positive health schemes like maternity and child health. Training of nurses and technicians was also begun. The help of the UNICEF was taken for the provision of equipment and supplies for demonstration projects. Demonstration projects were gradually replaced by mass programmes in the case of communicable diseases e.g. malaria and B.C.G. In certain countries like India, mass control programmes were switched over to eradication programmes as in the case of malaria. The WHO have also undertaken work to improve medical education, training of nurses, midwives and health workers. They have had Fellowship programmes which included such subjects as Radiation Medicine, Insecticide resistance and antibiotics. In general the trends of work in WHO may be described as follows. "Action to meet emergencies is giving place to programmes planned in advance for a period of years ; projects to bring about a particular advance are giving place to education work from which general advance may come ; and emergency action to control communicable diseases is giving place to investigation of their fundamental causes and to work for the eradication of some".

A summary of the important projects in India assisted by the WHO may be seen in Appendix V.

2. U.N.I.C.E.F.

The UNICEF is one of the specialised agencies of the United Nations created about 14 years ago for the purpose of providing aid, primarily in the field of health welfare and nutrition of the mothers and children.

It works in close co-operation with the other specialised agencies of the United Nations like the WHO, FAO and UNESCO. The UNICEF provides and supplies equipment not available within the country which asks for such help. It gives material help for the training of national personnel and technical advice is provided by the WHO and the FAO. Every type of UNICEF assistance has, as its basic purpose, the improvement of maternal and child health. The assistance given falls into the following major categories :

- (1) Basic maternal and child health services including health centres and training of national personnel ;
- (2) Disease control including control or eradication of diseases such as Malaria, T.B., Leprosy, etc. which affect large number of children ;
- (3) Nutrition including supply of milk for child feeding ;
- (4) Social services for children ; and
- (5) Emergency aid to mothers in times of earthquakes, famine etc.

India, which has undertaken intensive rural health development work by the establishment of Primary Health Centres in collaboration with the Community Development Centres, has received aid from the UNICEF in the shape of technical equipment, midwives and nurses kit, drugs, milk, vitamins, motor vehicles, bicycles etc.

UNICEF has supplied teaching and demonstration equipment for training centres for nurses and midwives. It has assisted in the development of pediatric training in the medical college hospitals in Madras, Andhra Pradesh, Bombay, Kerala and Uttar Pradesh. Almost half of the UNICEF aid so far given to India goes for the control of communicable diseases, particularly T.B., Yaws and Trachoma which have a high incidence among children. Primary Health Centres and maternal and child health centres have received substantial assistance. UNICEF has donated a D.D.T. plant to India. Next in the list of UNICEF aid comes the B.C.G. vaccination campaign. It has made possible the erection of a plant for the manufacture of B.C.G. vaccine needed in the country. Similarly UNICEF has assisted in the erection of a Penicillin Products Plant. UNICEF has also helped to equip three T. B. training and demonstration centres in India. It has provided aid to explore the possibilities for domiciliary treatment of T.B. It is also assisting in a small project to control yaws by providing equipment, vehicles and drugs.

The UNICEF will shortly be donating two plants for the manufacture of Freeze Dried Vaccine against smallpox as also equipment for the manufacture of Triple Vaccine and an iodisation plant. Drugs are provided by the UNICEF for the campaign against trachoma and leprosy.

The major cause of infantile and child mortality being malnutrition, the UNICEF has been donating powdered skimmed milk for distribution to infants and children through the maternal and child welfare centres, schools, clinics etc. They have gone one step forward and have set up milk conservation plants for the production and distribution of safe milk in larger quantities. Aid for nine dairy plants have also been promised and two of these are already working. This will stimulate production, processing and distribution of pure milk, as cheaply as possible. They train the national staff to plan, supervise and carry out the nutrition programme. In collaboration with the FAO, the UNICEF are helping to increase the production and consumption of protective foods.

3. Colombo Plan

The Colombo Plan is a co-operative enterprise of member Governments of the Commonwealth countries in order to further economic and social progress and to make these countries self-reliant. The Colombo Plan has contributed to the higher training of a large number of medical and auxiliary personnel in all fields. The All India Institute of Medical Sciences at Delhi was established with the financial assistance from one of the Colombo Plan countries viz. New Zealand. The Plan provides for visits to countries by experts who can offer advice on local problems and train the local people, and supply of equipment, especially to teaching institutions. Mention may also be made of the contribution by the New Zealand Government of a Dairy Plant to Delhi under the Colombo Plan. The contribution of Canada in supplying Cobalt Therapy units to medical institutions in India is another important item of aid under the Colombo Plan.

4. Technical Co-operation Mission

The Indo-U.S. Technical Co-operation Programme has entered the tenth year of its activity in 1961. The programme commenced in the first year of the First Five Year Plan and is based on an agreement signed between the Governments of U.S. and India on the 5th January, 1952, with the view of promoting and accelerating integrated economic development of India. Under this agreement, projects of technical co-operation mutually agreed upon between the two countries are executed. A separate Agreement is again signed for each of the projects in question. The schemes are jointly financed by both the Governments. The contribution of the T.C.M. is for meeting overseas' costs of

equipment and materials, freight, exports and training facilities. The U.S. International Co-operation Administration provides the financial assistance for the T.C.M. programmes. The total monetary allocations to all projects including health from 1952 to 1960 amount to 475.65 million dollars or Rs. 226.50 crores. It may be mentioned in this connection that health and sanitation get roughly 15.7 per cent of the total of Health.

The following projects under the T.C.M. are included in the field of Health :

- (i) Malaria control and malaria eradication ;
- (ii) National Water Supply and Sanitation ;
- (iii) Assistance to Medical Colleges and Allied Institutions ;
- (iv) Health Instruction Training Centres ;
- (v) Control of Filaria ;
- (vi) Medical Education ;
- (vii) General Nursing ;
- (viii) Insect-borne Disease Control.

5. Rockefeller Foundation

The Rockefeller Foundation has been operating in India from 1920. It began with a scheme for the prevention of Hook-worm disease in the Madras Presidency. Later the Foundation was associated with several health and medical programmes in India. In the beginning the Foundation had treated fields of Public Health and Medical Education as two separate issues. Since 1951, however, the two have been combined under a single programme with wide objectives.

The establishment of the All India Institute of Hygiene and Public Health at Calcutta was in a large measure due to the co-operation of the Rockefeller Foundation. The Foundation's programme included the training of competent teachers and research workers in a certain number of selected medical colleges, training abroad of candidates from India through fellowships and travel grants, research on fundamental health problems and the adoption of research as an integral part of the medical course and the sponsoring of visits of a large number of medical specialists from the U.S.A. Mention should also be made of the establishment of the Virus Research Centre in Poona by the I.C.M.R. in collaboration with the Rockefeller Foundation. The Foundation has not

only provided equipment and supplies, but also provided some of the staff members and facilities for the training of research work on insect-borne virus diseases. The I.C.M.R. has been receiving financial aid from the Foundation for the implementation of their fellowship programme for training junior medical teachers in Indian institutions. The Christian Medical College and Hospital at Vellore, the Seth G. S. Medical College, Bombay, the Christian Medical College, Ludhiana, the K. G. Medical College, Lucknow are some of the institutions which have been constantly helped by the Rockefeller Foundation over a period of years. Mention should also be made of the contribution of the Rockefeller Foundation to the All India Institute of Medical Sciences, New Delhi for the purchase of equipment and for construction work. As many as 145 Fellowships and 85 travel grants in the fields of public health, medical education, research, and nursing have been awarded by the Rockefeller Foundation so far.

6. Ford Foundation

This is another agency from which India has received aid for the implementation of some of its national health programmes. Their contribution has been mainly in the public health field. For instance the Foundation has helped in the establishment of public health orientation training centres, Research-cum-Action Projects in Environmental Sanitation, Pilot Projects in rural services at Gandhigram and the Rural Latrine Programme. The Orientation Training Centres at Singur, Poonamallee and Najafgarh provide training courses in public health for Doctors, Nurses, Health Visitors, Sanitary Inspectors, Midwives and other Public Health personnel all over India. The basic public health principles and health education techniques are emphasised in the training of such personnel. The Ford Foundation has also made available a large sum of money to support programmes of education and family planning for the Action-cum-Research Centres.

7. F. A. O.

The F.A.O. is mostly concerned with the problem of increased food production and banishment of hunger from the face of the earth. Herein comes the nutritional aspect of the people of India and the impairment of health through under-nutrition and malnutrition. In this respect, the F.A.O. has been working in close collaboration with other international organisations and with the Ministries of Food and Agriculture and Health in the Government of India. The F.A.O. had recommended at its conference in Rome in 1957 that due attention should be paid to the nutritional status of the people while formulating policies of food production in all countries.

8. Russian Aid

It will also be relevant to mention in this connection that in recent years USSR has made valuable contributions to India in the field of Paediatrics and Physiotherapy. We have also noted the projects to start in India a large-scale manufacture of drugs, antibiotics and medical and surgical equipment in collaboration with USSR.

9. Norwegian Aid

Mention should also be made of the financial and technical assistance given by Norway to India under the Indo-Norwegian Agreement signed under the auspices of the United Nations for the development of the Fishing Industry on modern lines.

10. CARE

A word about the activities of CARE (Co-operative for American Relief Everywhere) may not be out of place. The CARE is a non-profit, non-sectarian and non-governmental organisation of the United States, created in 1946 with the primary object of sending food from American donors to people of war-devastated Europe. Today this organisation serves 27 countries (including India) and supplies food packages and kits for use in vocational training, agriculture, health and education programmes.

11. Other Countries

Besides these some of the other countries have also helped India in various directions by way of supplies and technical aid.

In conclusion it may be stated that for the success of India's Five-Year Plans, we need, apart from our own internal sources, a helping hand from external and friendly quarters *inter-alia* in the matter of equipment, technical personnel, and technical know-how. And this timely help has been forthcoming in ready and abundant measure from the international agencies described in this chapter, and from other countries under bilateral agreements. We therefore wish to express our great appreciation of the work of these organisations, particularly in the field of Health.

CHAPTER IV

THE PRESENT STATE OF THE NATION'S HEALTH

(1) Mortality and Morbidity

CHAPTER IV

THE PRESENT STATE OF THE NATION'S HEALTH

It is a happy augury of the times that health in any country is no longer considered as merely a national problem, but it is looked upon as one of the fundamental international problems inasmuch as every nation is interested in the proper care of health in every other country.

The present state of the Nation's Health

A survey of the health conditions in the country was made at the time when the Bhore Committee submitted its report. In order to compare that picture with the present state of health statistical data are furnished in Appendix VII.

1. Morbidity

The estimated death rate has come down to 21.6 for the period 1956-61, as against the corresponding figures of 31.2 for 1931-41 and 27.4 for 1941-51. The infant mortality rate for the quinquennium 1956-61 is 135, the expectation of life at birth has gone up to 42 approximately, and deaths due to diseases like cholera and smallpox have been reduced. The health picture to-day is very different in many respects from what was presented by the Bhore Committee. This is due to various causes. In certain respects, the action taken by the Government to accept the policy of eradication of diseases, rather than of control, has undoubtedly led to a material reduction both in morbidity and mortality caused by some of these diseases. This is with particular reference to malaria, which has been accepted the world over as one of the diseases which produces the largest morbidity and mortality and which, thanks to the efforts of international organisations like the World Health Organization and the Technical Co-operation Mission of U.S. with the active co-operation of the Governments concerned, is now coming very much under control. We shall deal with malaria eradication in another chapter.

One of the diseases dreaded in the past was plague ; and while we note with satisfaction that the position regarding this disease is now very much more satisfactory and there has been no epidemic of plague for several years, it should be mentioned that there are certain factors which do not tend to give us the confidence that a recrudescence of the attacks may not occur.

We have already referred to the part played by international organisations, more particularly the W.H.O., the UNICEF, the T.C.M. and the Colombo Plan, in stimulating various measures both in this country and other countries for controlling diseases. They have acted as catalytic agents demonstrating to the governments and the people concerned that, given effective methods, many of these diseases can be controlled. It has also to be mentioned that the phenomenal advances that have taken place in the field of health and the discoveries in regard to the causation and means of control of many diseases have naturally led to a considerable reduction in the morbidity and mortality rates. Thus the part played by modern therapeutic agents cannot be under-estimated in comparing the figures of relative morbidity and mortality during the last twenty to twenty-five years. We have referred to these factors, because a correct appreciation of the advances that have taken place and of what still remains to be done cannot possibly be made, unless the factors that have indirectly and directly influenced the reduction of these morbidity and mortality rates are also taken into consideration. After giving due credit to the implementation of many health measures, it must be confessed that the general picture presented by the health statistics of the different States does not enable us to take too optimistic a view of the present state of Health and of the future health protection of the citizens.

It has been repeatedly emphasised that the most essential conditions for promotion of health are good housing, adequate and wholesome food, abundant supply of potable water, proper disposal of sewage, free perfilation of air, prevention of overcrowding and clearance of slum areas, supply of pure milk, particularly to children and, in general, the development of sanitary conscience in the community, as well as active participation of the Governments concerned in promoting the conditions necessary for inculcating in the people proper sanitary habits and attitudes. In dealing with the problem of health of school children, we shall have to refer to the unfortunate lack of any minimum standards of sanitation in most of the buildings for schools and colleges. In the attempt to promote school hygiene, it will be necessary to ensure that conditions are available which will inculcate in the children proper health habits from the early stage. These questions will be dealt with in greater detail in subsequent chapters.

One of the most important and pressing considerations that have been brought to the notice of the public and the government, and which the Committee fully recognised, is the rapid increase of the population as a whole, and the great changes that are taking place in the distribution of this population leading to grave problems so far as health authorities are concerned. Owing to conditions not favourable for the

rural population, large migrations have taken place to urban areas in the hope and belief that gainful employment will be available in such centres. Urban problems of health have therefore become very much more exaggerated, because there is no control over this migration, nor could adequate steps be taken for improving the housing and living conditions of this migrant population.

Yet another problem is the problem of the displaced persons after partition. While in the western region of India it may be said that steps have been taken with the willing co-operation of the displaced persons to resettle them and to provide for them as far as possible gainful employment, it must be stated, that in the eastern region, the same is not the case. The immigrant population has not readily accepted methods suggested by the Government for rehabilitation. While migration from the West has lessened greatly, migration from the eastern region unfortunately still continues, there being exacerbations of this immigration due to causes that need not be gone into. This has resulted not only in upsetting all calculations of health care of the particular State and the neighbouring States, but it has had repercussions over wider areas. *The Committee is fully aware of the efforts being made by the Central and State Governments to give relief and to provide satisfactory methods of rehabilitation, but in the absence of a measure of willingness on the part of the displaced persons, the problem is still there, not only for the displaced persons concerned, but also for the whole population of the State and even of those in adjacent areas.*

Another factor, which cannot possibly be ignored, is the wide variation in the intensity of the efforts made by different States to tackle health problems and to control diseases. While the Committee does not wish to refer in particular to any State, the impression gained after visiting many of the States is that there are wide variations not only in providing necessary facilities for health care, but also in the measure of control exercised by the authorities concerned in controlling the spread of epidemics or other deleterious factors affecting the health of the community. It cannot altogether be ignored that in some of these cases, the health authorities met with difficulties owing to unwillingness of the squatters to get away from the places where they settle down, and due to other undue influences brought to bear on them. Unless therefore the conscience of the citizens as a whole is stimulated to demand and accept better standards of health, unless the principles of sound hygiene are inculcated into the masses through health education and other efforts, and unless the Governments feel strengthened in taking positive measures to promote health, it will be a difficult problem for health authorities alone to ensure that the measures contemplated are actually implemented.

In regard to the care of the sick, great efforts have been made by Governments in most States and at the Centre to increase the facilities both in the opportunities available for the sick to resort to hospitals and dispensaries, as well as in improved schemes for giving satisfactory medical care to certain categories of persons like industrial workers, officers and employees of the Central Government and employees of some of the State Governments. We shall refer later to the Employees' State Insurance Corporation and the present state of medical care given through this scheme. One of our members was deputed by the Government of India to study and report on the scheme and we have had the opportunity to peruse this report. During our visits to cities like Bombay, Hyderabad and Calcutta, we have also availed ourselves of the opportunity to see some of the institutions and organisations started as a result of the E.S.I. Scheme through which this help is given to industrial workers. We note that in recent years special efforts are being made through the organisation of Community Development Centres that have been started to bring to the rural population, facilities for medical and public health care by providing as far as possible better sanitation, improved housing, prevention of certain diseases by prophylactic measures, maternity and child welfare, health education etc.

The total number of hospitals and beds has increased within the last 10 years. Thus while in 1950, the total number of hospitals and dispensaries was 8,600 and the beds 1,15,000, in 1960 the total number was 12,600 and 1,85,000 respectively. Appreciable as this increase is, it must be confessed that taking into account the conditions under which sickness prevails and the large increase in population, the increase in hospitals and dispensaries has not made that impression that such an increase might have made otherwise. It may also be pointed out that it is not the number of hospitals or the number of beds so much as the arrangements for the medical care for the people that have to be examined. It is the impression of the Committee that this aspect is the most sadly neglected part of medical care. Overcrowding in hospitals, inadequate staff, non-availability of some of the essential drugs and medicines, the mixing of really serious cases with trivial cases, absence of attempt at co-ordination of hospital services and the close proximity of the Out-Patient Department with the hospital proper, have all produced conditions in which urgent changes seem to be absolutely necessary. Even with the existing hospitals and beds, considerable improvements can be made if proper organisational efforts are forthcoming. This aspect of organisational set-up is being referred to elsewhere and suggestions have been made as to how an Out-Patient Department should be organised with reference to hospitals.

One of the most important points stressed by the Bhoré Committee is in regard to the number of medical personnel required for the country. We do appreciate the fact that after Independence great efforts have been made in this direction and the number of medical colleges has increased from 25 in 1947 to 61 in 1961 which include a number of medical schools which have since been converted into medical colleges. The number of medical students admitted to these colleges has increased during this period from 1,983 to 5,900. In regard to nurses, the number of nurses has increased from 15,000 in 1950 to 27,000 in 1960 and the number of training institutions for nurses has increased from 206 in 1951 to 270 in 1958. Likewise, more dental colleges, more training institutions for pharmacists, more training centres for auxiliary nurses, technicians, etc. have been started particularly within the last decade. The number of training institutions for other nursing personnel like Auxiliary-Nurse-Midwives, Health visitors and Dais has increased from 229 in 1951 to 535 in 1958. We have however come to the conclusion that despite all these efforts, difficulties have arisen in proper care of the patients because of maladjustment in the distribution of trained personnel and the tendency for trained personnel to congregate in urban centres owing to lack of amenities and gainful employment in rural centres. Another contributing cause is that highly trained members of the medical profession are now utilised to carry out routine duties which can be easily done by less qualified people such as technicians. Attempts are now being made by the various States to give fairly attractive terms of employment to the personnel posted to rural areas, who cater to the needs of the rural population in some measure. We shall refer to this when we come to the chapter on "Medical Care".

At this stage, we should make it clear that in our opinion the need is to conserve the more highly trained personnel to jobs that they ought really to be doing and let the bulk of the work, which is of a routine nature, be done by those whose qualifications will be enough for that purpose, though they are not highly trained members of the medical, nursing or dental professions.

There is one other aspect of the question to which we wish to refer. At present there are certain diseases which are prevalent more particularly in certain areas. Tuberculosis, smallpox, cholera, leprosy, filariasis, etc. can be mentioned as examples. While we do appreciate the attempt to start mass campaigns against these, we feel that under present conditions the method of dealing with them individually is not conducive to the organisation of the unified effort that is needed for the promotion of total health care. We are of the opinion that health personnel—doctors, nurses, health workers, midwives etc.—must be

equipped and trained to tackle all health problems in any area. The personnel employed in mass campaigns, when no longer needed for that purpose, should not in view of their training be wasted but should be properly utilised for planned health work in the country. We have at present many of these auxiliary personnel well trained in programmes connected with the control of malaria, smallpox, tuberculosis and other diseases. We would emphasise the necessity for giving such persons a reorientation in other aspects of health care and utilising them for the health programmes undertaken in the States. It has been our experience during our visits to note that persons who are deputed to one type of work, for instance, tuberculosis, do not consider it necessary to utilise their knowledge and resources to tackle other forms of diseases that may be prevalent in that very area. While we have no doubt that the overall supervision for particular diseases requires special attention through individuals, who are devoted to their particular fields, in the rural areas it is neither possible nor desirable to have separate agencies to deal with separate diseases.

We wish to make one last point as a general observation. It has been our experience, and we have noted it during our visits, that generally an intensive effort is made when an epidemic breaks out or a sudden catastrophe occurs leading largely to temporary measures which are not co-ordinated. This, in our opinion, leads to wastage both of effort and of finances. Such should not be the case if a proper survey is made and records of epidemics, for instance, are collated and the spots where they originate are taken note of. In dealing with epidemics like cholera, it can be ascertained by careful observation and research what exactly is the source of such occurrence. We think if radical changes are made in regard to good water supply, drainage and other requirements, instead of making sporadic efforts at the time of epidemics, a large amount of finances can be more usefully diverted to permanent measures for eradication of these diseases. We shall deal more elaborately about these and other factors in the chapter on "Communicable Diseases".

CHAPTER V
MEDICAL CARE
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1. Bhoré Committee's Recommendations

The Bhoré Committee reported as the result of their survey, that a major share in the provisioning of hospitals was borne by the State, only 566, (7.6%) out of a total of 7441 medical institutions in the provinces, being maintained by private agencies. The Committee pointed out that medical relief facilities in the country were entirely inadequate—in quantity as well as in quality. This state of affairs in the view of the Committee was due to an attempt to establish medical institutions without providing for their proper staffing, equipment and maintenance.

The total number of doctors registered in British India at the time was 47,524 giving a ratio of 1 to 6300 as against 1 to 750 in United States and 1 to 1000 in U.K. There were wide variations in this ratio from province to province and between the rural and the urban areas. The population served by one medical institution averaged, for example, 17,600 in the urban areas and over 1 lakh in the rural areas in U.P. On an average only 0.24 beds were available per thousand population while in many places the ratio was even lower. The dispensaries that existed in the rural areas were extremely poorly housed and staffed and were generally starved of drugs and dressings. Facilities in the form of specialist hospitals for tuberculosis, leprosy, cancer, mental diseases, etc. and for the treatment of infectious diseases were entirely inadequate.

The main base of the recommendations of the Bhoré Committee in regard to medical relief was in the form of the short and the long term plans built up on an integrated curative and preventive service manned by whole-time salaried staff. The Committee left to the Governments of the future to decide whether medical service should be given free to all or on a system of payment through insurance or by some other method.

The short-term programme of the Bhoré Committee proposed the setting up of primary health centres at the periphery catering to a population of 40,000 each. A 30-bedded hospital was intended to be provided to serve four primary health centres. A secondary health centre with an initial bed strength of 200, to be raised to 500 by the end of the tenth year, was another part of the programme. The secondary health centre was to cater to a population of 600,000 and serve as a supervisory co-ordinating and referral centre for the primary health centres in the area. It was visualised that at the district level there would be 500 beds in the short term plan. It was anticipated that the bed population ratio would rise to 1.3 per thousand in the course of 10 years,

and to 2 beds per thousand by 15 years. Mobile dental clinics and dental wings were also recommended and it was hoped that with improved communications and means of transport and telephone and ambulance service, the best medical skill would be brought within the reach of the entire population through the system of primary, secondary and district health centres. Each primary health centre in the short term programme was to have 2 Medical Officers, 4 Public Health Nurses, 4 Midwives, 4 trained Dais, 2 Sanitary Inspectors, 2 Health Inspectors, 2 Clerks and 15 Class IV employees.

In the long-term plan — the 3 million plan, the District Health Organisation was to have a hospital with a bed strength of 2,500 at the district headquarters, 3 to 5 Secondary Centres each with 650 beds, and 15 to 25 Primary Health Units with a bed strength of 75 each, catering to a population of 10 to 20 thousands. An adequate number of Social Workers, Public Health Nurses, etc. was to be attached to the institutions at the various levels to allow complete institutional and domiciliary medical coverage to the entire population. This plan was to take the bed population ratio to 5.6 per thousand. For this programme it would be necessary to have about 2.3 lakh doctors and 6.7 lakh nurses.

2. The Present Position

The actual progress in regard to expansion of medical care facilities while noteworthy in some respects has not been up to the standard contemplated by the Bhore Committee. The following table brings out the existing position as against that obtaining in 1946, and targets fixed by the Bhore Committee for 1960 :

	1946		Bhore Committee's Targets	1960	
	No.	Ratio		No.	Ratio
Hospitals and Dispensaries	7,400	1:40,000		12,000	1:35,800
Beds	1,13,000	{ 0.24 per 1,000	{ 2 per 1,000**	1,85,000	{ 0.40 per 1,000
Doctors	47,524	1:6,300	1:2,000@	88,000	1:4,850
Nurses	7,000	1:43,000	1: 500@	30,000	1:14,300
Primary Health Centres	Nil	Nil	..	2,800	1:70,000*

* (Population which the existing Institutions actually serve) ** By 1961
@ By 1971

The 2,800 out of the proposed 5,000 Primary Health Centres, each serving a population of 65 to 75 thousand with only 1 Doctor, 1 Sanitary Inspector, 1 Health Visitor, 1 Pharmacist and 4 Midwives, provide only 6 beds each. The Secondary Health Centre programme has not progressed much and the district hospitals, with the exception of some States, have generally a bed strength of a hundred or thereabouts with little or no specialist facilities, inadequate nursing staff, poor equipment and insufficient provision for drugs and diet. Almost one third of the total number of beds are to be found in the 125 teaching hospitals. 47% of the total number of beds are provided by 6.6% of the hospitals with 200 beds and above. Hospitals with a bed strength of less than 50 form over 70% of the total number of hospitals, and only 19% of the total beds are to be found in them. 77% of the hospitals with 71% of the total beds are run by Government, 11% by municipalities and 12% by private and voluntary agencies.

As against 322 districts in India, hospitals with more than 150 beds are only 236. If allowance is made for the fact that 125 of these are hospitals attached to medical colleges, it means that two thirds of the districts are served by hospitals of less than 150 beds. This brings out the disparities in the distribution of the hospital facilities and the extreme pressure under which the comparatively small number of hospitals with the major portion of the total number of beds, have to function.

If this is the position with regard to general hospital beds, the situation in respect of special hospitals and beds is even worse. For a million and a half estimated open cases of tuberculosis there are not more than 30,000 beds. The mental hospitals can accommodate not more than 15,000 out of an estimated total of more than a million patients needing hospital care. Leprosy institutions can accommodate only 20,000 of the two million cases. Although 35 to 49% of the normal load of hospital out-patients and in-patients consists of children, paediatric services in the form of separate hospitals, children's wards and paediatricians are too meagre, there being just about 2,000 paediatric beds as such.

The hospitals employ on an average 1.4 person per in-patient. In the large majority of cases, however, this personnel is also used for out-patient services, which is of the order of 435 attendances in a year for each bed. The initial cost per bed varies from Rs. 10,000 to 20,000 and the maintenance cost from Rs. 1,500 to Rs. 3,000 per annum. The per capita cost on health ranges from Rs. 1.5 to Rs. 4.0 in the various States.

Average distance (Miles) of the nearest hospital by population size class of the sample villages, from two interpenetrating samples (N.S.S. — 11 and 12 Rounds)

Population Size Class		11th Round		12th Round	
		Percent of villages	Average distance (Miles)	Percent of villages	Average distance (Miles)
(1)		(2)	(3)	(4)	(5)
Up to 200	..	33.6	9.83	33.1	9.80
201 to 500	..	33.6	9.09	34.1	7.92
501 to 1,000	..	19.5	7.73	18.8	8.50
1,001 to 2,000	..	9.1	7.53	9.4	7.56
above 2,000	..	4.2	6.65	4.6	7.14
All Classes	..	100	..	100	8.58
No. of sample villages	..	1,779	..	1,728	

* National Samples Survey, Report No. 17 Tenth to Twelfth Round: December 1955 — Aug. 1957. ("Indian Villages: A study of some social and economic aspects").

Actual and Proportional expenditure on Medicine and Medical Services in the Rural and Urban Sectors (N.S.S. Rounds 4, 7, 9 and 10).

Item of expenditure	Sector	Period	Expenditure per person per month	Percentage of total expenditure	Number of sample house-holds
(1)	(2)	(3)	(4)	(5)	(6)
Medicine	Rural	1952	.34	1.59	8,545
		1954	.22	1.27	1,413
		1955	.34	2.26	1,536
Medical Services	Urban	1952	.86	2.89	3,877
		1954	.12	.69	1,413
		1955	.11	.72	1,536
Total	Rural	1956	.07	.40	1,616
		1956	.16	.63	1,325
		1954	.34	1.96	1,413
All India		1955	.45	2.98	1,536
		1956	.43	2.29	2,754 "

3. Some General Considerations

(a) Target for hospital beds :

The Bhole Committee had drawn attention correctly to the utter inadequacy of institutional facilities for the treatment of the sick and taking a hint from the prevailing bed-population ratio in some of the advanced countries of the world, had suggested the target of more than five beds to be reached within a period of 15 to 20 years. In fact the bed—population ratio has hardly touched 0.4 per thousand by the end of 1960. Even at the present level of population, about 20 lakh beds will have to be provided as against 1,85,000 beds available at present to reach the suggested proportion. If, however, the population increase is accounted for, six lakh beds will be required by 1976 at the rate of only one bed for each 1,000 population. This would require the addition of 1.5 lakh beds in the Third, Fourth and Fifth Plan periods each. The average initial cost of these beds would thus amount to Rs. 300 crores in one plan period. The magnitude of such an undertaking would be obvious when it is remembered that the estimate of cost given above excludes the maintenance expenditure of these beds and that the total outlay earmarked for Health in the Third Five Year Plan is only Rs. 341 crores. In Appendix B.—5 will be found a table in which an exercise has been made to project the need of hospital beds on certain assumptions regarding population growth, rate of sickness etc. This projection also gives an approximate estimate of the construction and maintenance cost of hospital facilities on the basis of certain tentative assumptions.

In considering this question, we would like to point out that with control of communicable diseases, a large proportion of hospital beds constructed in many Western countries for the treatment of tuberculosis and infectious diseases etc. are reported to be lying vacant. Nearly 50% of the total beds in some countries are set apart for treatment of mental diseases. Without suggesting however that the hospital facilities available within our country can be considered adequate or that enlargement of the existing capacity is not necessary, we feel all the same that the targets set out earlier appear to us to be unduly optimistic. If, within the next 15 years we can raise the hospital strength so as to provide 1 bed for a thousand population which will bring into existence 600 thousand beds, the target need not be considered as too low. Already with the control of malaria a large proportion of beds occupied by malaria cases are available for other patients. With the increasing tempo of communicable disease control programmes, the position should improve further. We shall further discuss in the subsequent paragraphs the methods of reducing the demands for additional beds to the minimum through the expedients of domiciliary service, quick turnover of the hospital beds and

the provision of convalescent homes etc. to reduce the pressure on the hospital beds.

(b) Financing of medical care :

In the preceding paragraph we took into account only the initial cost of 1,50,000 hospital beds per plan period. The addition of 1.5 lakh beds in each Five Year Plan period would involve an additional recurring cost of Rs. 45 crores per annum or Rs. 225 crores for the 5-year period. Thus the total outlay in each of the three five year periods so as to bring into existence 6 lakhs beds by 1976 would be as follows :

	Capital Cost	Maintenance Cost (Rupees in crores)	Total
1st five year period	300	225	525
2nd "	300	450	750
3rd "	300	675	975
	<hr/> 900	<hr/> 1,350	<hr/> 2,250

Thus the approximate outlay of this programme alone would have to be on an average at the rate of Rs. 750 crores in each Five Year period. Various suggestions have been made from time to time in regard to finding the resources for meeting the cost of such programmes. The levy of a health cess is one of such proposals. We understand, however, that this proposal has been considered by the Central Council of Health, but has not evoked a favourable response as a large number of other cesses are already being levied. U.K. and the Communist countries are the only places where completely free medical care is provided by the State. The economic basis of the communist countries has no application to the structure of our society. In U.K. it was as a result of the beginnings made in 1911 under the National Health Insurance Act, that the means for the curative services became available in 1948. With the existing number of hospitals, dispensaries, beds and health personnel in the country, the development of a medical care programme on the lines of a National Health Service cannot be considered a practical proposition in the near future, especially if this has to depend entirely upon the State revenues. It is pertinent to point out in this connection that the social security facilities in U.K. are earned by the average citizen only at the cost of the payment of a contribution at the rate of over 5 shillings per week. If a suitable standard of medical care facilities is

therefore to be developed in this country, the public hospitals will have to resort to a system of levy of fees for the services rendered, both for in-patient and out-patient services, except in the case of the truly indigent. Unless those who are able to pay are made to pay for the services, the State will not be able to extend the hospital facilities at a more rapid pace than has been the case in the past, and to cover more adequately those sectors of the population which are in more urgent need of medical care but cannot pay for it. It will be relevant to point out here that the National Sample Survey studies as well as the health survey in community project areas in the Second Five Year Plan, have revealed that even among the poorest sections of the rural communities 2 to 3% of the total expenditure is incurred by the citizen on medical care. If expenditure at this level is already being incurred by the average rural citizen, what is required is to canalise this outlay systematically through prepayment or insurance plans to build up medical care facilities on a sounder basis within a short period of time. For creating a climate that will help to popularize an insurance scheme it is necessary that the public institutions should restrict free medical care only to those who are truly indigent. Rules governing free services of different kinds given by the public medical institutions will, of course, have to be strictly enforced.

The Committee observed that while State and Central Government servants of a particular category are given certain concessions with regard to medical attendance and medical care and they have not got to pay anything for these the industrial employees getting less than, Rs. 400 per month have compulsorily to join the Employees State Insurance Scheme and have to contribute a percentage towards this benefit. The Committee feels that a long range health insurance policy should be adopted for all citizens of India on the same basis. The rate of contribution for health insurance may depend upon the income of the persons concerned. So far as the indigent population is concerned, it should be the responsibility of the State to provide all possible means of medical care. How best medical care could be given to the population has been seriously discussed by us. We feel that it is very important, in view of the need to provide medical care to all people, that a certain distinction should be made between those who can afford to pay and those who are unable to do so. The indigent population must be protected, in their own interest as also in the interest of the community at large. Those who can afford to pay and those who get a salary above a particular level should pay in proportion to the salary they get, for necessary services rendered to them for treatment in the hospitals. The enforcement of such a provision in the polyclinics and in the out-patient departments will meet with many great difficulties but we feel that most of those who attend the out-patient department,

except the very indigent, would willingly pay a small amount, as they do in some of the voluntary institutions. This, however, will not apply to those who are covered by the insurance scheme or any other Government scheme for their employees.

The experience of the working of the Employees State Insurance Scheme, the Contributory Health Service Scheme for the Central Government servants in New Delhi and the demands being made for the extension of these or similar schemes to other sectors of the population lead us to believe that the time is ripe for the introduction of a scheme of medical care insurance. There is a provision in the Employees State Insurance Act for extending the benefits provided under the Act to all sectors of workers, though at present such benefits are applicable only to workers covered by the Factories Act. This and the Contributory Health Service Scheme should, therefore, be developed to give a much wider coverage than is the case at present.

4. Medical Care Co-operatives

It would be of interest in this connection, to draw attention to some of the studies carried out in this direction. Dr. Ralph G. Victor who studied the economic aspect of the question of medical care on a co-operative basis at the instance of the All-India Co-operative Union about three years ago made some observations and recommendations which are briefly summarised below: Consumer sponsored pre-payment co-operatives run without governmental help or control do not have much chance of successful operation in India because of (a) the promises publicly made by the Government offering free medical aid to all citizens, (b) the socialistic pattern within the country, (c) the relative backwardness of the masses, e.g., their illiteracy, poverty and lack of social consciousness, (d) the absence of a felt need except among a small middle class urban population and (e) the reluctance of the physicians to work in rural areas. On the other hand the following factors appeared to him to be strongly in favour of the setting up of medical co-operatives.

(1) The Government cannot provide the level of medical care that most people want.

(2) At the same time most people cannot afford the fees charged by private practitioners.

(3) Medical care co-operatives may help in the better distribution of doctors away from the urban areas and may also solve other problems of medical care. For the promotion of co-operative medical care programmes in the rural areas it is considered that Government

should come forward with an initial capital grant for buildings and equipment, with a grant for the revolving drug fund and the payment of auxiliary personnel such as nurses, midwives, etc. attached to the co-operative health centre to assist the doctor in his work. The Medical Co-operatives need not try to include hospitalisation facilities within the services offered at the initial stages. It is strongly urged that medical care co-operatives be developed in each State on a pilot basis, inspired and subsidised by the Government.

An outline of the scheme suggested by Dr. Victor will be found at Appendix B. 6.

5. Recent trends in Medical ^{Logistics} Programme and the role of Hospitals etc. Hospitals

An Expert Committee set up by the World Health Organisation has made some very useful suggestions which are briefly summarised below :

"The hospital is an integral part of the socio-medical organisation the function of which is to provide for the population complete health care both curative and preventive and whose out-patient services extend to the family in its own environment. The hospital is also a centre for the training of health workers and for bio-social research. The modern hospital is thus a link between all aspects of the healing art including the prevention of disease. Medico-social activities, public health administration and private practice carried out by medical practitioners in their consulting rooms all represent aspects of medicine which should be allowed to develop freely but which should also find in the general hospital, material support and close co-ordination. The general hospital should be a centre in which medical practitioners could find professional and intellectual aid, as its consultant services extend to the patients' home with the co-operation of the family doctor. The function of a modern hospital should be :

- (1) care of the sick and injured,
- (2) the education of the physicians, nurses and other personnel,
- (3) the promotion of health and prevention of disease,
- (4) advancement of research in scientific medicine, and
- (5) health education of the public.

Maternity and Child Health

"Preventive and curative activities of maternity and child health services have already been largely integrated in the out-patient departments of many hospitals in different parts of the world. Further integration of social paediatrics and maternal and child welfare should be encouraged. Pre-school and school health teams can also work in close co-operation with the hospital paediatric out-patient department.

Control of Communicable Diseases

"The case finding and immunisation procedures could be carried out by the hospital out-patient department, while epidemiological work will be chiefly the responsibility of the health authorities. The need to take steps for the prevention of chronic diseases such as the rheumatic group and cardio-vascular diseases, among many, was stressed. Routine and periodical examinations and health check up should be encouraged.

"The hospital should organise a mental health service for the purpose of an early detection and treatment of psychiatric cases in their initial stages when treatment does not involve prolonged institutional care.

Health Education

"Health education should be carried out in hospital wards and out-patient departments designed not only to help patients but also their families at a time when they are all especially receptive to the advice of doctors and nurses. The medical social worker and the nurses should be encouraged to do Health Education within the frame work of their duties.

"In ante-natal, maternal and child welfare clinics, attached to an out-patient department, the public health nurses could give useful advice to mothers both in their own interest and in that of the health of their children born and unborn, with practical demonstrations wherever possible.

"The hospital and public health laboratories should be integrated wherever possible. It is considered that the hospital should make all its facilities available for public health purposes, a practice which would contribute to the programme of community health and result in a substantial saving in equipment and personnel. This should be particularly done at the district and regional level.

"One of the main functions of the hospital is training of health personnel, doctors, nurses, health visitors and other para-medical personnel. All hospitals should be regarded as potential teaching units and should, as far as possible, make all the facilities available for the training of medical and para-medical personnel.

Research

"Research is an integral part of any hospital where teaching and service is being given. When preventive services are also being emphasised, it is very necessary that it should take part in the epidemiological study of the disease that occurs in the region, area, etc. Hospitals, with their special facilities, could act as centres for medical research, stimulating, encouraging and assisting all those working within the area.

Standards for fixing bed strength

"With regard to the bed strength of hospitals in any particular area, the following factors have to be taken into consideration :

- (1) the age distribution of the population ;
- (2) the general standard of living, special habits, local housing conditions and transport facilities ;
- (3) the population density, urban areas requiring more beds per thousand inhabitants than rural areas ;
- (4) the incidence of disease and injuries ;
- (5) the standard of development of medical care provided outside the hospitals by private practitioners and health centres ;
- (6) the system adopted by a country to finance its hospitals, Governmental legislation or social security scheme.

"No general hospital should have more than approximately 600 beds. It is suggested by the Expert Committee that the Regional hospital may serve a population of 1 to 4 million inhabitants ; the intermediate hospitals can serve approximately 250,000 inhabitants, while the local hospitals cover the needs of 20,000 to 60,000 inhabitants. These figures may be widely modified according to geographical conditions and concentration of population.

Out-patient Department

"This is one of the most important departments of a hospital.

More patients can be treated on an ambulatory basis as out-patients if proper diagnostic, laboratory and radiological facilities are available at the out-patient department. With the rising cost of inpatient treatment, it would be far more economical if out-patient departments are expanded and patients treated outside. The out-patient department also should become the medium for the promotion of health and prevention of disease. Here, the co-ordination between the clinician and the Health Officers can be readily effected.

"The out-patient department should be a structurally functional part of the general hospital, though it may be necessary to effect decentralisation by establishment of out-patient clinics throughout the area. These clinics should form an integral part of and be dependent on a central hospital where a more specialised consultation service would be available. All the specialist departments in the out-patient service should be manned by the specialists who are attending the indoor cases so that a continuity can be maintained. A comprehensive health care programme of the highest possible quality should be the aim of the out-patient departments of general hospitals.

'An out-patient department of a general hospital should be planned, staffed and equipped so as to provide a comprehensive diagnostic service and specialised treatment beyond the capacity of a general practitioner or health centre. A well-organised out-patient department can do much to save valuable hospital beds by giving advice about and supervising home treatment and by undertaking the detailed clinical investigations of non-urgent cases prior to admission.

"The medical records in the out-patient department should be properly kept, as morbidity statistics of the population of the area could be obtained from these, and as they will be of great value to the patient, to the hospital and to the physicians.

Follow-up

"The out-patient department should be responsible for the follow-up of patients discharged from the wards and who are directed to apply to special clinics after discharge. The follow-up function of the department is an important duty which rests upon the medico-social worker for assessing the patients' social

and emotional environment at home and at work and ascertaining that suitable conditions exist for this return.

“With regard to the administration of the out-patient department, the Expert Committee thought that the following suggestions should be taken into consideration :

- (1) Overcrowding and unnecessary waiting should be reduced to a minimum by establishing wherever possible, an efficient appointment system ;
- (2) that the department's working day should be so adjusted, wherever necessary, as to enable workers to attend in their off-duty time ; and
- (3) that adequate nursing and secretarial help should be provided to enable doctors to concentrate upon their proper tasks.

“Wherever possible the question of establishing polyclinics should be taken up.

Home Care Services

“Domiciliary service has come into prominence after the discovery of chemo-therapeutic drugs in the control of disease. Also in the treatment of chronic illness, home care is far cheaper and at the same time, more emotionally suited. In home care service, the hospital assumes the responsibility for the over-all organisation and supervision of the programme, and the day-to-day medical care of the health centre or a private practitioner. Home medical care programme can be applied only with a minimum standard where proper facilities are available for the proper care of the patient. Home care is not easily carried out when housing conditions are poor. Home care systems claim that the patient in his own home should have a standard of care almost equivalent to that provided for patients in a hospital with the exception that certain highly technical services and heavy equipment cannot be taken into the home.

Administration and organisation

“Hospitals are administered better by physicians with administrative experience. A medically qualified hospital administrator could nevertheless be assisted by a fully trained lay hospital administrative assistant who could be responsible for certain duties. Or, an administrative committee could be organised

to assist the hospital administrator to discharge these duties. In a big hospital, a fulltime physician administrator should be employed.

Role of Nurses & Medico-Social Workers

"Health education of the people who come in contact with the patients and their relations and the staff that work in association with them should be part of their duty. The medical social workers are specially important in the out-patient departments.

Interchange of technical personnel between hospitals at different levels

"This is of paramount importance. Interchange of professional personnel can only take place between people of comparable status and tends to be limited to the lower professional grades, but wherever it is possible, it should be utilised.

Hospital facilities for public health purposes

"All the hospital facilities and equipment wherever practicable should be utilised for the promotion of health and prevention of diseases. Where general practitioners work independently of the hospital, one way of bringing them more intimately into the sphere of the hospital activities is to make these services available to them.

Participation of Medical Practitioners in Hospital Activities

"Every effort should be made to have field participation of the general practitioners as honoraries in hospital activities. The confidence of the medical profession would be enhanced if a representative of the local medical profession were appointed to the Hospital Advisory Committee. The hospital should also organise clinical meetings where general practitioners and Public Health Officers should be welcomed.

"The staff conference of the medical staff should be encouraged both for professional care and organisational matters. There should be an analysis of clinical work showing the gross results of treatment and mortality rate in the hospital and the autopsy rate. Clinico-pathological conferences should be held periodically besides clinical departmental conferences.

Medical Audit

"The medical audit is a new concept. It should be encouraged in every institution. It is the review of the professional work in the hospital that could take place whenever the medical

staff meets to analyse the hospital's clinical work. Medical audit gives a stimulus to the practice of scientific medicine and an objective and specific check on the standard of professional work performed in the hospital. The medical audit throws light on the following :

- (i) Standard of administration of the hospital.
- (ii) Inadequately equipped physical plant.
- (iii) Lack of essential services needed to support care for patients.
- (iv) Lack of competent personnel for proper supervision of patients.
- (v) Deficient personnel policies affecting morale.

The medical audit can be conducted by a specialist in medical audit or by a committee, representing the major clinical services. The members of the Committee should look at the medical record room, evaluate the results and should be well informed on the work going on in the hospital. The following items may also be looked into by the medical audit.

- (1) The average bed occupancy.
- (2) The average length of stay of a patient.
- (3) The gross results of patient care.
- (4) The death rate.
- (5) Consultations.
- (6) Infections.
- (7) Complications occurring in clean surgical cases, obstetric cases and medical cases.
- (8) Unnecessary and incompetent surgery.
- (9) Autopsy rate.
- (10) Staff conferences.

RECOMMENDATIONS

6. General

We have already indicated our view that it would neither be practicable to provide medical coverage in the near future on the scale visualised by the Bhole Committee, nor would it be feasible for the State to extend such coverage on the basis of a medical care service,

free to all. We are of the view that if hospital beds could be provided in the course of the next two or three plan periods, at a scale of one bed per thousand population, it should be considered fairly satisfactory. The hub of the net-work of medical care services should be the district hospital which must be expanded and strengthened with specialist facilities in order to be able to serve the needs of specialised services in the district, by providing the requisite clinical facilities in the hospital itself and by having mobile teams of specialists who could effectively cover the area of the district, and provide necessary supervisory and consultant facilities at lower levels. The Taluq hospitals will also have to be developed in a way as to take care of the routine medical, surgical and obstetrical and gynaecological needs of the area of the taluq, but the emphasis will have to be, in the first instance, on the district hospital. The resources in terms of money and personnel to provide the required standard of medical care facilities at the level of the district, the taluq and the primary health centre are not likely to be available to the required extent in the near future. Taking into account, however, the rapid developments in the means of communications, we feel that if the district hospitals are properly developed, these will prove the most practicable and economical way of providing medical coverage to the population of the district. The Primary Health Centres, of which nearly 3,000 are believed to have already come into existence and 2,000 are expected to function by 1963-64, would form, in a way, the first line of defence, as focal points for an integrated health service in the rural areas.

We are setting out in the following paragraphs our recommendations in regard to the development of institutional medical facilities at the various levels beginning with the Primary Health Centres. The success of the programme will depend upon :—

- (i) the speed with which Primary Health Centres of the type we have in view are set up ;
- (ii) the provision of the necessary facilities for mobility of the touring teams and for ambulances etc.;
- (iii) the raising of the district hospitals to the bed strength of 250 to 500 with all requisite specialities ; and
- (iv) the linkage on a regional basis of the district hospitals with the teaching hospitals in the area for purposes of expert assistance in specialised diagnostic and curative techniques.

7. Primary Health Centres

We took every opportunity that came our way in the course of our tours either individually, or in groups or collectively

to observe the actual working of the Primary Health Centres. These visits only served to confirm our impression that as they are at present constituted and staffed, the Primary Health Centres are not equipped to give the integrated health service expected of them. Even in West Bengal where the staffing pattern is much more liberal than elsewhere and where medical officers are available even at the sub-centre level, public health orientation of the health centre activities was not in evidence in the manner and to the extent to which it is necessary. The reasons for this are not far to seek. One of the foremost is that of the quality of the personnel. For reasons, not necessary to recount here, rural service has not been popular and where the positions are not actually vacant, the incumbents with rare exceptions, look upon it as a period of forced labour until they can manage to find their way to a more congenial posting in a city hospital or the health department. We propose to go into the causes and suggest the remedy for this state of affairs in greater detail in a subsequent paragraph. Another factor responsible for the functioning of the health centres as glorified dispensaries is the lack of orientation of the medical officers and the other staff in public health methods. If the medical officers are themselves not seized of the importance of maternal and child health work, of vaccination and immunisation, of environmental sanitation and vital statistics etc., it would be vain to expect from them the leadership expected of them in these fields. The most serious drawback is that the responsibility of providing integrated health care to a population of 60 to 70 thousand is too heavy for a team of one medical officer, one sanitary inspector, one lady health visitor, one pharmacist and 3 midwives or dais. If allowance is made for the 1961 census figures, the population per Block is more likely to be nearer 80,000 than 60,000. Under these conditions it is perhaps not unnatural that even a medical officer suitably orientated to public health is precluded from engaging in preventive work by the sheer weight of the curative work that he has to shoulder. It has now become the normal practice with the medical officer on his visits to the sub-centres to attend only to the patients waiting for him there. Although two-month orientation courses for the Primary Health Centre staff were started some years ago at the Singur, Poonamallee and Najafgarh health centres, the advantage of these is negligible considering the large number of adverse conditions under which the staff have to work. In this connection, mention must also be made of the impression gathered by us of the lack of adequate guidance and supervision of the work of the Primary Health Centre staff. The district officers in many cases were not quite clear in their own minds about the concept of an integrated health service, while in some other instances dual control of the curative and preventive functions resulted in an unhappy state of affairs. Besides this, only some of the

Health Centres, comprising those taken up by the UNICEF for assistance, are in possession of independent conveyances, the others having to depend upon vehicles from the Development Block organisation. The relationship between the Block Development Officer and the medical officer-in-charge of the Primary Health Centre is still in the process of evolution and the achievement of harmony and co-operation in this relationship may be delayed by the emergence, in the meantime, of the Panchayat set-up.

On the whole, therefore, the Primary Health Centre programme, as it has developed, may be said to bear no resemblance to that visualised by the Bhore Committee.

The Bhore Committee suggested the setting up of Primary Health Centres for a population ranging from 20 to 40 thousand. This recommendation could not possibly be carried out owing to several factors—paucity of finance and of medical and para-medical personnel including nurses and midwives. We, therefore, feel that while the idea of the primary health centre is an excellent one it would not serve any useful purpose if centres are established without adequate facilities, resources and personnel.

The Primary Health Centre programme in our view therefore needs to be radically revised. We suggest

- (i) that the further opening of Primary Health Centres on the existing pattern be discontinued ;
- (ii) that the new Primary Health Centres to be opened should be on the pattern of the recommendations of the Bhore Committee as stated below to serve a population of upto 40,000 :—

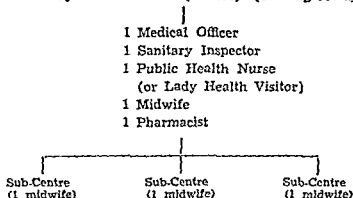
Medical Officers	..	2	
Public Health Nurses	..	4	
Nurse	..	1	
Midwives	..	4	
Trained Dais	..	4	
Public Health Inspectors	..	2	
Health Assistants	..	2	
Pharmacist	..	1	
Clerks	..	2	
Fitter Mistry	..	1	
Inferior Servants	.	15 ;	:

- (iii) that the Primary Health Centres already opened should be upgraded by stages to reach the level suggested under sub-para (ii) above.

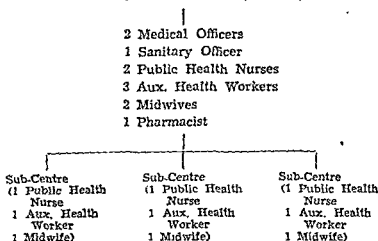
Our suggestion for the discontinuance of the Primary Health Centre programme until it can be implemented on the scale suggested above may appear to be retrograde, but we think that in the present set-up, with the increased facilities of road communications, telephone and telegraphic devices and in view of the proposed establishment of modern hospitals at district headquarters and at the taluqs, it may be preferable to provide medical coverage to the rural population through mobile health vans visiting them from the district and taluq headquarters, instead of multiplying Primary Health Centres on the existing pattern. Such mobile units can cover every day several of the villages and those requiring hospitalisation or intensive medical care can be brought in the ambulances to the hospitals for necessary treatment. This, we feel, will for the present perhaps be the better method. We, however, visualise that in course of time when facilities in regard to personnel, finance and other requirements are sufficiently enlarged, the Bhoré Committee formula of the Primary Health Centre can be adopted. The Primary Health Centre should have a building which can accommodate the entire personnel working at the centre and with a bed strength of 10 which would include two beds for emergency cases. Each Primary Health Centre should, of course, have a suitable conveyance including an ambulance and a jeep. Wherever it is possible the Primary Health Centre should be located in association with other developmental activities of the Government such as in the departments of education, agriculture, animal husbandry and co-operative cottage industries. This will serve as a unit of the social security services for the community. Unfortunately, these services are at present, in some areas at any rate, dispersed over different villages and thus lack community approach and the collaboration and co-operation which is necessary in the various sectors of activity.

For the upgrading of the existing Primary Health Centres, the schema stated below is intended to serve as a guide for the evolution of the existing primary health centres and the sub-centres into full-fledged centres in course of time. It will be noticed that auxiliary health workers are to be increasingly used in the Primary Health Centre programme and that the medical officer is to be helped by a sanitary officer trained in public health upto the B.Sc. standard. Our recommendations with regard to the training of the latter will be found in the chapter on 'Professional Education' :—

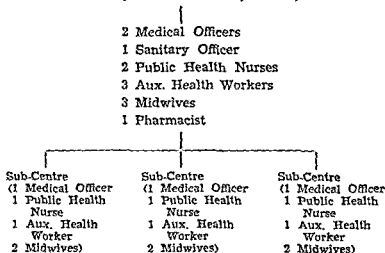
1. Primary Health Centre (6 beds) (existing set-up)



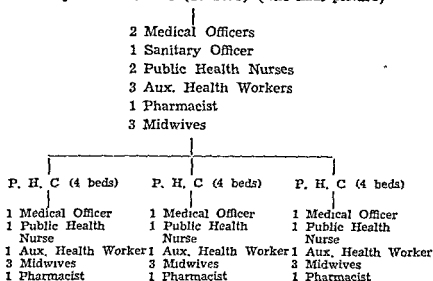
2 Primary Health Centre (10 beds)



3. Primary Health Centre (10 beds)



4. Primary Health Centre (10 beds) (The final picture)



Our recommendations in regard to the Primary Health Centres mark a distinct departure from what has come to be accepted, during the course of the last 10 years, as the pattern of the Primary Health Centres. We suggest therefore as a first step that it will be useful for each State to work out some model projects on the lines indicated above so that such necessary adjustments in the strength of the personnel etc. may be carried out as may be found necessary in the light of the experience of the working of the revised pattern of the Primary Health Centres. The model centres to be set up will, of course, need to be supported by hospital services at the taluq and district head-quarters, by the necessary telephonic facilities and by an ambulance and mobile service. In this connection we would also like to mention the facilities of police wireless communications which have now come into existence over the greater part of the countryside. The use of these facilities should be open to the Primary Health Centre staff for purposes of communication with the district head-quarters in cases of emergencies etc.

We have referred earlier to the question of the non-availability of suitable medical officers for the Primary Health Centres. In almost all States a proportion of the centres remain without medical officers for varying lengths of time. While the difficulties and hardships of rural life, problems of education of children and inadequacy of emoluments are some of the factors responsible for creating this situation, these by no means are a complete explanation of the existing state of affairs. To these must be added the present method of teaching in the medical colleges and the working conditions in the rural areas. In spite of the setting up of the Departments of Social and Preventive Medicine in the medical colleges in recent years, public health orientation to the present

day student and the imparting of a rural bias to him in the course of his training has not progressed much. The reliance on mechanical means of diagnosis and treatment has increased so much that the medical officer feels helpless without these. The working conditions and the equipment etc. available at the Primary Health Centres are so poor and inadequate that practice of scientific medicine is difficult, if not impossible, under these conditions. Apart from improving the conditions of service in regard to emoluments etc., it is therefore imperative that training be orientated in order to prepare large numbers of students going through the medical colleges for undertaking public health duties in the rural areas and that steps be taken for the equipment and staffing of the Primary Health Centres so as to facilitate a better standard of work to be undertaken at these centres. It is partly with this object in view that we have suggested the discontinuance of the programme of opening of Primary Health Centres of the existing pattern and the opening of a smaller number if necessary, of better equipped and better staffed health centres. We hope also that the increased contact between the Primary Health Centre and the district or taluq hospital through mobile teams, which we have also suggested, will help greatly to overcome the sense of isolation under which the Health Centres function at present.

In regard to the terms and conditions of service of the medical officers serving in the Primary Health Centres, we suggest :—

(1) That every doctor, who wishes to enter Government service, should put in two years of rural medical service within the first five years of his service ;

(2) That every medical practitioner, who wishes to be taken as an Honorary Assistant Surgeon or Physician, should likewise spend at least one year in rural medical service ;

(3) That a number of stipends should be given in the different medical colleges—at least 10% of the number of students enrolled—from whom a bond will be taken that they will serve for 5 years at rural centres ;

(4) That all those who are to be selected for post-graduate studies should have put in 2 years of rural medical service ;

(5) That persons who have recently retired must be re-entered if they are willing to serve in rural centres upto the age of 60. In suitable cases, this age limit may be extended ;

(6) That the terms of service for these medical personnel must be attractive ; viz.

- (i) while the Primary Health Centre medical officers should not be allowed private practice, they should be given adequate non-practising plus public health allowances ;
- (ii) adequate facilities for residential accommodation should be provided ;
- (iii) the existence of different categories of cadres in the State Health Services should be done away with, there being one unified cadre of Assistant Surgeons to man the rural health centres, as also the hospitals, etc. at higher levels ;
- (iv) all medical officers in the cadre should be posted to rural assignments by rotation ;
- (v) service in rural area should be an essential pre-requisite for confirmation in Government service and in crossing the efficiency bar ;
- (vi) other things being equal, preference should be given for post-graduate training to those who have to their credit service in the rural areas ;
- (vii) posting to a Primary Health Centre should normally take place only after one or two years' service in a hospital or in other posts under the supervision of another medical officer ;

(7) That nursing, dental, midwifery and para-medical personnel should also be recruited for these rural centres, if the work is to be done in a satisfactory manner ;

(8) That a number of associated Departments should be located in the same centre and not dispersed over a number of villages as at present ;

(9) That every Primary Health Centre should have a jeep with a trailer which can be utilised by the medical staff ;

(10) That communication should be made easy through telephone and wireless services at the police headquarters for purposes of medical relief ;

(11) That the District and Taluk Headquarters hospitals should have mobile units with ambulance service for catering to the needs of the rural areas ;

(12) That medical education should receive a greater amount of financial and other help from the Central Government. All post-graduate education should be the responsibility of the Centre. In regard to the starting of more medical colleges, there must be more

financial co-operation between the State and Central Governments as in the case of technical and technological institutions ;

(13) That the services of private practitioners should be availed of wherever possible on a part-time basis for rural medical help as well as for school medical relief, public health and sanitary duties ;

(14) That in general, the conditions of service, emoluments, etc. of medical men taken into Government service should be considerably revised so as to be on a par with the conditions of service obtaining in the Indian Administrative Service. Such permanent incumbents should have no right to private practice.

We would advocate that for each State, a small committee should be set up which will review from time to time the conditions of rural medical relief and suggest, in the light of our general recommendations, what other steps should be taken.

8. The Taluq Headquarters Hospital :

We observe that the level of development of the taluq and district headquarters hospitals varies widely over different parts of the country. In many cases the taluq hospitals in the South have developed in size and services to an extent even more than the district headquarters hospitals in other parts of the country. It does not therefore appear to be feasible to lay down any uniform pattern of the taluq head-quarters hospitals. Generally speaking, however, taluq hospitals should have a minimum bed strength of about 50 and should have on their staff at least three medical officers dealing with medicine, surgery and obstetrics and gynaecology. Each such taluq hospital should serve as a referral centre for the majority of routine type of cases from two or three Primary Health Centres in its area. One of the medical officers will deal with Obstetrics and Gynaecology and will look after Maternal and Child Health and Family Planning work in the area in addition to the clinical duties at the hospital.

Good clinical side-room facilities should be available at the Taluq Hospital. As far as possible, one of the three medical officers, if not qualified in clinical pathology, should have had at least 3 to 6 months training in laboratory work. There should be a competent laboratory technician, to work under the supervision of the medical officer. The laboratory should be able to handle all routine work other than serology and culture.

9. The District Headquarters Hospital :

As stated earlier it is our view that in the present stage of development, re-organisation, expansion and improvement of the hospital

services at the district headquarters is the most important single step for the improvement of medical care facilities for the people at large. Provision of good medical care is becoming a highly complex and expensive matter and it is much better to concentrate adequate facilities at a few points instead of trying to scatter inadequate and ineffective medical care facilities over a larger number of points. As long as there is an adequate ambulance service, we have no doubt that with the means of communications as they have developed and are likely to develop in the near future, good medical care could be brought within the reach of the large bulk of the population through a well-developed district hospital system with mobile specialist teams and ambulance service. On the other hand with the development of a good district hospital service, a better standard of work could be achieved in the teaching hospitals by a great deal of the existing load being taken away by the district hospitals.

Each district headquarters hospital should therefore be expanded to 300 to 500 beds depending upon the population to be served. Of these about 75 beds may be set apart for maternity cases and about 50 for paediatrics. In addition to specialist services in medicine, surgery, obstetrics and gynaecology, the district hospitals should provide specialist facilities in eye, ear, nose and throat, paediatrics, tuberculosis, dentistry and venereal diseases. It is suggested that the three main specialists in medicine, surgery and obstetrics and gynaecology should have a status not lower than that of a Civil Surgeon, one of them acting as the Medical Superintendent of the Hospital. As suggested in another chapter, the medical superintendent of a hospital with more than 300 beds will be independent of the District Medical and Health Officer. The District Medical Officer of Health may preferably have his office in the hospital premises in the interest of the development of an integrated concept of health services for the district as a whole.

In addition to the number of beds suggested above each district hospital should have attached to it an isolation unit of about 50 beds capable of temporary expansion when necessary. The T.B. Clinic and the Public Health Laboratory at the district headquarters should also work in close association with the district hospital. The Laboratory and X-Ray services at the hospital should be adequate for meeting not only the needs of the hospital itself but also the needs of all the medical units in the district including the taluq hospitals and the primary health centres.

10. Mobile Units :

In the staffing of the district hospital, provision will need to be made of mobile teams which, apart from being on call for emergency

purposes from other units in the district, should also visit the taluq hospital and selected Primary Health Centres for purposes of consultation and supervision of the work of the lower units. The Dental and the T. B. Clinics at the district headquarters should have their own mobile vans fitted with X-Ray to visit the peripheral units.

We have stated in another place that in association with the district headquarters hospitals, there must be a chronic and convalescent hospital. We consider the starting of chronic and convalescent homes both in teaching centres as well as in district hospitals essential, especially to relieve the congestion in the hospitals, and the strain on the medical and para-medical staff working there. The Committee feels that such homes would be more economical than trying to meet the total needs through hospital beds. These should form separate units and their strength will depend upon the total strength of the hospital to which they are attached. The medical officers attending the district headquarters hospitals would be responsible for occasional visits to these chronic and convalescent centres.

Expert advice and assistance, both in the matter of investigation and diagnosis and in treatment, should be available to district hospitals, a number of which should be linked with a teaching hospital for this purpose on a regional basis.

The provision of a blood transfusion service has a great impact on saving life and for the treatment of many diseases. In every district headquarters hospital and in all teaching institutions a blood transfusion officer should be available both for carrying on blood transfusion work and for doing any research under the blood transfusion scheme. Arrangements for the transport of blood to other places wherever required should also be available. At the headquarters of the State there should be a special department which should organise blood transfusion service and prepare the subsidiary products that are necessary for this purpose.

It will also be necessary to have a Centre for the treatment of burns cases, immediate and latent, so that both questions of rehabilitation as well as urgent treatment may be attended to and research carried out.

In each big city, owing to a number of accident cases, a separate orthopaedic unit particularly for fractures and other injuries should be established. We are referring to this in the section on Out-patient Departments in big hospitals.

11. Distribution of beds :

In planning hospital facilities, it may be well to work on the basis of one bed for every thousand of the population in each district.

Of the total number of beds the district headquarters should provide for 500 to 750 beds. From 600 to 800 beds for each district may be provided at the taluq level, depending upon the number of the taluqs in each district. The Primary Health Centres will add to this total number of beds at the rate of 10 for each primary health centre. In deciding on the number of beds in each locality and their dispersal, the beds available in the private or voluntary hospitals in the area should be taken into account. The important thing is to ensure that from the smallest to the biggest hospital they function as an integrated whole, a higher level of specialist service being available at each successive tier from the primary health centre, the taluq, the district and the teaching hospital. A certain measure of regional demarcation of a number of districts round a teaching hospital has been suggested elsewhere. This regional distribution should coincide as far as possible with the administrative regionalisation of the health services which we have suggested while considering administrative organisation.

Hospital Out-patient Departments :

The planning and organisation of the out-patient departments of hospitals deserve special care. Reproduced below is an extract from a report submitted by a Committee set up by the Madras Government to make recommendations for the reorganisation and improvement of hospital services at Madras. Although the recommendations are with reference to a particular situation, these set out some general principles which are, in our view, equally applicable to hospitals elsewhere in the country :—

“The Out-patient Department :

The next important question which merits very serious consideration relates to the Out-patient Department. The number of out-patients has increased enormously, more particularly in recent years and to-day the average number is nearer 4,000 which means that on some days it is much more than that. One has only to go to the Out-patient Department in the morning hours to realise the congestion that prevails, the impossibility of any proper attention being given to the patients, in view of the extreme crowding that is apparent. Under these circumstances, it is not surprising that in spite of the best efforts of the doctors and the nurses, the out-patients are not satisfied. Very often, serious cases cannot be attended to as promptly as they should be, because of the rush and because of the large numbers collecting. There is not enough room for these patients, not even standing room, let alone sitting room, nor are there any amenities for the out-patients.

To those who have visited hospitals in the Western countries, the Out-patient Department is about the most inviting place where every patient has got a seat, where there is a cafeteria for the patients and where waiting is not such a serious strain. When it is further realised that surgical and medical cases requiring specialist treatment are all crowded in this one centre which is not sufficient to hold even 250 to 300 out-patients on a morning, the condition can be better imagined than described. The need to organise the out-patient Department is very urgent. It is obvious that this cannot be done within the existing premises of the General Hospital. A proper Out-patient Department, well-organised and well-run, will be a great relief to the In-patient Departments, as in most cases treatment in the Out-patients Department will be sufficient with methods of diagnosis being available and, if necessary, detention of the patient for a day or two.

"To add to the confusion and to the difficulties of the in-patients, the General Hospital is the one Hospital which receives the largest number of casualty cases. Casualty cases are increasing day by day owing to the number of road accidents of a serious nature. The admission of a large number of casualty cases including emergencies of medical and surgical practice involves the use of the same operation theatres, the use of the same post-operative wards, whether by night or by day, and the phenomenal disturbance to the seriously operated cases right in the middle of the night by such casualty cases being wheeled into the wards. The time is come, therefore, when a bold plan ought to be thought out for the treatment of out-patients who resort to this hospital. After careful consideration, it is suggested that the only method of dealing with this is by utilising the next-door big compound which now houses the penitentiary. The premises thus rendered vacant could in course of time be suitably altered to meet the following requirements :

- (1) A properly planned out-patient department with separate entrance for many of the special departments ; waiting rooms, treatment facilities with examination rooms wherein seminars of clinics can be conducted for medical students and post-graduates.
- (2) A Casualty Department for emergency cases and accident cases open by day and night with accommodation for 20 to 30 beds to keep such cases for a period of 24 to 48 hours, with all facilities for resuscitation, blood bank, etc.

(3) An Orthopaedic Department with about 100 to 120 beds where most of the accident cases involving fractures and other such injuries can be transferred after 24 hours treatment at the out-patient.

"It may also be utilised for certain other departments such as eye, nose and throat, the bulk of which work is out-patient and could, therefore, except in serious cases, be accommodated in a small ward for operated cases.

"It is essential that in such a set-up there should be full diagnostic facilities, X-Ray diagnostic apparatus, pathological, bacteriological and bio-chemical laboratories with qualified personnel and other facilities for immunisation of out-patients and treatment of cases of rabies.

"At each of the big cities there should be a big Blood Transfusion Centre with facilities for research and transport of blood to other places wherever required.

"It will also be necessary to have a Centre for the treatment of burns cases, immediate and latent, so that both questions of rehabilitation as well as urgent treatment may be attended to and research carried out.

"In each big city, owing to a number of accident cases, a separate orthopaedic unit particularly for fractures and other injuries should be established. This we have already referred to in the paragraph on out-patient departments in big hospitals.

"The special clinics which are run in the Out-patient Department will obviously be located here, such as the diabetic clinic, the borderline mental clinic, the allergy clinic, the chest clinic. It can also be used, if properly planned, for the treatment of leprosy cases and for the diagnosis of early or incipient cases of leprosy. In fact, we consider that this large campus can be suitably designed so as gradually to meet all these requirements which are largely requirements for emergency or out-patient practice.

"There is one aspect of the question to which we wish to refer. At present, the diagnostic facilities available in the General Hospital are not adequate. They are time-consuming, cause the patients many days of in-patient rest and, from the point of view of the Government waste of public money. In some cases, it is even more unfortunate that in serious cases, it

may not be possible to arrive at a quick decision to take prompt measures for surgical treatment. Thus, in cases where radio-diagnosis of the gastro-intestinal tract or special diagnosis of an abnormality connected with the urinary tract or the gall-bladder has to be ascertained by visual aids with X-Ray photographs, the delay is sometimes as long as two, three or four weeks because of the heavy load on the X-Ray Institute of the General Hospital. This Institute has to cater not only to the out-patients and in-patients of the General Hospital but also to cases from other hospitals. It is imperative that more X-Ray diagnostic units must be set up in the General Hospital and in every one of the other hospitals in the city so that much of this work can be done in the hospitals themselves. To centralise all this is to effect false economy, not to speak of the great delays caused.

"This suggestion also applies to other laboratory investigations such as bio-chemical investigations. In these days of modern therapy, bio-chemical investigations play a very important part in the proper treatment of diseases and if, for instance, the bio-chemical laboratory of the college is to carry out bio-chemical investigations of not merely this hospital but of others as well, delays are inevitable. It is very necessary to have separate bio-chemical, pathological and bacteriological units in the hospital itself, apart from the unit which is responsible for teaching purposes and for post-graduate instruction.

"It is also necessary to see that so far as District Headquarters Hospitals are concerned, such units are made available. Till such units can be made available, decentralisation of the State into 4 or 5 zones, each zone as far as possible having a teaching centre for a group of 2 or 3 Districts, is the best method of solving this problem.

"An unfortunate trend in our country born perhaps of a misplaced sense of economy, is to deny highly technical and comparatively better paid staff, the help of adequate para-medical and secretarial assistance. The result necessarily is that part of the time and attention of the specialists is occupied in routine matters, which could well be attended to by others. Not only efficiency but the output is also thus lowered. There is a very good case, therefore, for a much larger complement of ancillary staff being allowed to the hospital units than at present. This should include besides stenographers and clerks, medico-social workers, technicians, physiotherapists,

dietitians, etc. We have referred earlier to the views and recommendations of the World Health Organisation Expert Committee on Hospitals. If the hospitals are to approach the ideal of health centres for the community, which the expert committee has visualised, and if the suggested follow-up, health-education and other activities are to be undertaken by the hospitals, reinforcement of the teams is unavoidable."

13. Special Hospitals

In our view the following types of special hospitals could be placed in this category :

(i) **Paediatric Hospitals :** The present number of about 2,000 paediatric beds is extremely small. There is a great need for children's hospitals either as separate wings of hospitals or as separate hospitals. Besides this there should also be hospitals to care for the handicapped children where physio-therapy, occupational therapy and facilities for general education as well as for training for useful vocations should be available. At present there are very few such centres and we recommend that in each State, at least two such centres should be opened so that the requirements of this very important class of patients may be met. The Education Department should co-operate with the Medical Department in the development of the required facilities.

(ii) **Maternity Hospitals :** The provision of adequate maternity facilities is of basic importance for the health and welfare of the coming generations. The damage done to the health of the mother as well as that of the new born through lack of adequate ante-natal, natal and post-natal facilities is indeed colossal. We have referred elsewhere to the preventive aspects of maternal and child-health services and have drawn attention to the need of the co-ordination of such services with the Maternity Hospitals. The large majority of these, even where they exist at present function in comparative isolation from the field services in the sphere of maternal and child health. The proportion of births taking place in maternity homes and hospitals is a fraction of the total births. There are only 20,000 maternity beds in the country as against $1\frac{1}{2}$ crores babies born every year. The demand for institutional confinements is steadily increasing with the result that totally inadequate as the number of maternity beds is, the duration of the post-natal stay in hospitals is beginning to be reduced below the limit of safety. There is also inevitably a lowering of the standard of service as the result of the unusually heavy pressure on the maternity beds. We have already suggested earlier that adequate provision should therefore be made in the District and Taluq Hospitals for maternity beds apart from the maternity beds at the Public Health Centres. Apart from this, wherever possible

independent maternity hospitals should be brought into existence so as to increase within the shortest possible time the hospital facility for maternity cases.

Maternity wards or maternity hospitals should be available in all large towns and cities and they should be spread over in the city so as to afford facilities for 100 women in different localities to get admission easily.

In regard to admission, it is desirable to encourage the habit of the pregnant woman attending the ante-natal clinic regularly. This is the rule in many countries in Europe. A booked case is one who is attending the ante-natal clinic of the maternity hospital and who is constantly under observation. As all possible care is being taken during the period of pregnancy, avoidable complications are prevented from occurring. In all large municipalities, it would be very desirable that as far as possible only booked cases will ultimately be admitted. It would be necessary under existing circumstances that there should be domiciliary visits paid by trained health visitors or midwives to periodically examine pregnant women and ensure their ante-natal care. The maternity hospitals should also have facilities for post-natal care of mothers.

The integrated programme of hospital care recommended by us should provide for the confinements of complicated labour cases at the District Headquarters Hospitals. It is also our view that each well-developed maternity hospital and maternity wing should undertake domiciliary midwifery in its respective area.

The question of having a paediatric section in a maternity hospital looked after by the paediatrician during the first year of the child's life may also be considered. The larger maternity hospitals should be training centres for nurses, midwives, nurse-midwives, medical students and a variety of paramedical personnel for services in the field of maternal and child care.

We recommend a planned method of development of maternity homes and maternity hospitals with attached antenatal clinics and facilities for the system of promoting booked cases for admission to such hospitals. Besides these hospitals, there should be an ambulance service to attend to emergency cases at the homes or to transport such cases to the hospitals.

We would also like to re-emphasise in this connection the need for the integration of the services of the maternity and child welfare health centres with the nearest maternity hospital.

(iii) **T. B. Hospitals:** Each taluq hospital should have 10 to 15 beds for isolation of infectious T.B. cases. At the district level, where a separate T. B. Hospital does not exist, 30 to 50 beds should be provided for cases of tuberculosis.

(iv) **Facilities for Mental Health Care:** Each district hospital should have a psychiatric clinic in the course of the next 10 years. Five to 10 beds at the district level may be earmarked for psychiatric cases. Mental hospitals should be developed on a regional basis, the optimum bed strength being about 750. The majority of the mental hospitals are at present extremely overcrowded and understaffed. It is only in some places that there is an evidence of their transition from custodial to curative institutions. We have laid stress elsewhere on the importance of developing preventive psychiatric services, but even so the existing institutional facilities for the treatment of mental illness fall so short of the needs that within the next 10 years the number of mental hospital beds should at least be doubled.

(v) **Cancer:** Although treatment of cancer is provided at most of the larger hospitals in the country, the number of hospitals devoted exclusively to the treatment of cancer can be counted on the finger tips. Even many of the teaching institutions do not have separate cancer hospitals or cancer wings. It is suggested that each teaching hospital should have its own separate cancer clinic with an independent cancer wing if not a hospital. Each State should have a full-fledged hospital equipped with modern facilities for the surgery and radio-therapy of cancer cases.

(vi) **Leprosy:** The control of leprosy requires methods of mass survey and treatment through field teams. It is all the same necessary for leprosy hospitals to be available for the treatment of cases requiring isolation, surgery and rehabilitation. Such hospitals are required in the endemic areas and should be associated with rehabilitation centres.

Our recommendations on the preventive aspects of T. B., Cancer and Leprosy are found elsewhere.

(vii) **Ophthalmic Services and Hospitals:**

The incidence of eye diseases in this country is considerably higher as compared to the incidence of similar diseases in foreign countries. In some areas the incidence is as high as ten per cent of the total population. Besides this there is a dearth of ophthalmic specialists who can take adequate care of these patients. This high incidence of eye diseases has resulted in an appalling rate of blindness. On a rough estimate the figures of blindness in India are 1.5 persons per thousand

of population. This figure does not include the partially blind population. Thus about one million people are totally blind and at least double the number partially blind, and showing ocular morbidity. These figures exclude cases of cataract which can be cured by an operation. Comparing these figures of 2,500 blind persons per million population to data in some of the countries in the West which are highly industrialised, the inadequacy of ophthalmic service in this country becomes evident. With the exception of Egypt, India has the highest proportion of blind population. This country has yet to be industrialised and with the development of heavy industries there is going to be an increase in ophthalmic hazards, which will further accentuate the problem of blindness. Some of the more important causes of blindness are simple glaucoma, couching, dense corneal leucoma, trachoma, ophthalmic neonatorum nystagmus and small-pox.

Prevention of blindness is thus a problem of great magnitude in this country. This can be achieved in the following ways :

Preventive and social medicine personnel should be properly instructed with regard to the incidence of these diseases and the measures necessary for preventing them so that they can carry out mass propaganda regarding the incidence and the hygienic measures necessary for the prevention of the same. Small-pox, trachoma, infectious diseases and accidents fall in this group.

An intensive ophthalmic service should be developed throughout the country. At the present rate of development it will not be possible to provide enough semi-specialists and specialists in ophthalmology in spite of our best efforts. Special ophthalmic services, at least in each district headquarters and adequate number of beds in the district hospitals for the treatment of ophthalmic diseases are necessary. The hospitals should be given ad hoc grants to equip themselves for the diagnosis and treatment of ophthalmic diseases.

In view of the fact that inspite of the best efforts of the country, it does not seem possible to provide the adequate number of specialists and semi-specialists in the subject, the Committee view with grave concern the tendency of some of the universities and the Indian Medical Council to reduce the period of training at the under-graduate level in this course and in some others the tendency to completely abolish the assessment of candidates. If this attitude is encouraged the ophthalmic services even for minor ailments will become hopelessly inadequate. This will adversely affect ocular morbidity and blindness, thereby increasing the size of the problem. The Committee, therefore, considers that at the under-graduate level the students should be adequately trained in the subject of ophthalmology and should be assessed separately with regard

to his fitness in this subject. The combination of this subject with surgery for assessment must be deprecated. It is felt that the student should be given at least 50 lecture-demonstrations and should be posted to the wards and Out-patient Department for a period of not less than 13 weeks.

In order to encourage the students to take up ophthalmology as a career, a careful watch should be kept on the methods of teaching and the degrees and diplomas to be awarded. Ophthalmic training suffers further from lack of facilities for the treatment of squint. The facilities for ophthalmic research are also limited and specialised sections like ocular pathology are wanting in most of the teaching institutions. We tried to find out if the department of general pathology in these institutions can handle ophthalmic pathology efficiently and the general pathologists heading these departments made no secret of the fact that they could not do so. In these circumstances the Committee feels that an orthoptic training centre to train ancillary ophthalmic personnel should be immediately started and orthoptic sections should be instituted in all teaching institutions. Similarly a specialised section in ocular pathology should be established in various teaching institutions so that ophthalmic research does not suffer. The orthoptic centres and ophthalmic research will considerably help in the reduction of ocular morbidity figures. Drug research in ophthalmology is also inadequate and efforts should be made to give impetus to research in this direction. The prevention of blindness and reduction of ocular morbidity can only be achieved by the following measures :

Training of personnel for propaganda and mass therapy in rural India.

Starting mass campaigns against diseases like trachoma, small-pox, corneal ulcers etc.

Opening of Ophthalmic Clinics and Hospitals at least at the district level.

Continuance and intensification of mobile ophthalmic units ; but these units should be equitably distributed and become really effective rather than remain so in name only.

Inclusion of adequate training and adequate assessment of medical students in ophthalmology at the under-graduate level. A minimum of 50 lecture-demonstrations and 13 weeks training is desirable.

Ensuring uniformity of standard at the diploma level by the constitution of a central examining board so that the practising ophthalmologists are trained to a satisfactory standard.

Institution of a specialised school for the training and care of visually handicapped persons with regard to vocation and rehabilitation.

(a) **Ophthalmic Hospitals:** There should be one Ophthalmic Hospital for each State with 300 to 500 beds. Each district hospital should have 10-15 ophthalmic beds with a specialist, depending on the population. It should be possible for the specialists to visit the hospitals in the district and organise eye camps. Every regional hospital i.e. medical college centre should have 50 to 100 ophthalmic beds.

(b) **Rehabilitation of the Blind:** A random sample survey carried out in Delhi indicates that nearly 4% of the families residing in Delhi had a handicapped member, blindness being the most common cause followed by orthopaedic handicaps. The Government of India run a National Centre for the blind children. A similar centre for the adult blind is also being run where workshop facilities are also available for training in crafts. There are understood to be about a hundred schools for the blind in the country mostly run by voluntary agencies. Out of the estimated total of 2 million blind persons, only about 50,000 can read Braille.

(viii) Deafness :

(a) **Incidence of deafness:** No reliable figures are available about the incidence of deafness in the country. From the total number of cases studied in the E.N.T. Department of the All India Institute of Medical Sciences during April, 1960 to March, 1961, however, it is gathered that 17% of them suffered from defective hearing. Statistics taken from New York School Children in this respect work out to 4% while the London figure comes to 6%.

(b) **Prevention of deafness:** Among the All India Institute of Medical Sciences cases referred to above, deafness in over 80-90 per cent was preventable, the largest incidence being of upper respiratory tract infection. The non-preventable cases were due to various causes. Physical handicaps in hearing can be prevented if infection of upper respiratory tract is not neglected, diving and swimming are avoided during a cold, and earaches are given proper medical attention. This requires primarily education of general practitioners and mothers and the inclusion of simple hygienic measures in text books for lower and primary classes. General practitioners will need to be re-oriented on the simple causes of deafness. With a little care myringotomy operation can be performed in most district hospitals or primary health units. The offending adenoids and tonsils which cause deafness should be detected and subjected to operation. All cases of infection should be

treated adequately and should be combined with treatment of infection of the nose. Regular check-up of upper respiratory tract infection, adenoids and tonsils and of the ears of youngsters should be done through school health care.

(c) **Noisetrauma** : Consistent and frequent exposure of the human ear to loud noises is damaging to hearing. Incidence of deafness on this account is likely to increase with the rapid industrialization of the country. Use of recognised methods to prevent damage to hearing will be required. A survey of incidence of this type is suggested. Infections like mumps, meningitis, typhoid fever, T.B., syphilis, leprosy also give rise to deafness.

(d) *Training of Medical Personnel in the field of Ear diseases* : Training of young ear surgeons in the latest types of surgical aid in improvement of hearing is necessary and the setting up of 3 or 4 centres for such training on a national level is suggested.

Mechanical aids for those hard of hearing should be manufactured in India.

A National Committee to supervise the schools for the deaf in the country and establishment of uniform standards of teaching is necessary.

Occupational therapy and speech therapy for those who require these should be considered. Training in foreign countries to a special group of technicians to make them speech therapists, is recommended.

(e) **Rehabilitation** : There are understood to be about 50 Schools for the deaf people in the country, most of which are run by voluntary agencies. Facilities for providing training in crafts, etc., to the deaf adults are badly needed. We do not have adequate facilities for the ascertainment of the loss of hearing, and for prescribing and testing hearing aids. Expansion of audiological facilities is an urgent need in the country. The indigenous production of hearing aids which should be available to the people at reasonable rates is another urgent need.

(ix) **Orthopaedically Handicapped** : In the absence of any surveys, it is not possible to say with any certainty the number of orthopaedically handicapped children and adults in the country. From what one sees in the hospitals and the public places, it is obvious, however, that the number of such persons is very large. They naturally constitute a major portion of beggars, vagrants and unemployed. This is linked with the improvement and expansion of hospital facilities with particular reference to orthopaedic beds and specialists, physiotherapists

and occupational therapists. But apart from this, facilities also need to be provided for the education and training of the orthopaedically handicapped. It is understood that there are just about a dozen special institutions for the orthopaedically handicapped children. The position with regard to the availability of facilities generally in this matter is very unsatisfactory. An Institute of Physical Medicine, it is understood, was set up by the Government of India some years ago with the object partly of producing trained workers in prosthesis, physiotherapy, etc., and partly to serve as a demonstration centre for the rehabilitation of the handicapped. The progress of this institution has unfortunately been very slow. It is of the highest importance that this institution be developed into a full-fledged training and demonstration centre in physical medicine as quickly as possible. It should be possible for such an institution to take on limb fitting activities which are at present being done almost entirely by the Army Limb Fitting Centre at Poona. Training facilities need also to be expanded in such manner as will make it possible for similar centres to be set up in other parts of the country on a regional basis and for a sufficient number of physiotherapists to be produced for manning the larger hospitals in the country. A training centre like this should also provide facilities for vocational guidance and placement.

Every State should have an orthopaedic hospital with wings for accident service. Casualty departments or casualty hospitals should also be encouraged wherever possible in view of the steep increase of all forms of accidents.

The Committee notes that there are several disabled persons (congenital and acquired), suffering from occupational diseases or from diseases due to service in the Armed Forces, who are at present unemployed. The Committee is of the opinion that this class of population should not be allowed to roam about as beggars, but that some attempt should be made to rehabilitate them in fruitful employment. They should be taken note of and suitable avenues found for them according to their capacity and training. The Committee would, in this connection, invite the attention of the authorities to the provisions that at present exist in Great Britain by which such persons are compulsorily to be employed in certain works up to a limited percentage. Although it may take some time to bring about such a development in India the Committee feels that note should be taken of this aspect of the question and steps taken gradually to absorb these persons in employment.

(x) **Infectious Diseases Hospitals:** Our recommendations regarding hospitals for infectious diseases will be found in the Chapter on 'Communicable Diseases'.

14. Dental Service

An organised-net work of dental clinics as part of the health services, has not so far been setup. Dental care, to the limited extent to which it is available to the masses, outside the cities, is in the hands of dental practitioners who have had little or no systematic training. The Dental Clinic Service has not developed to the extent needed to provide at least one dental clinic in each district. With rare exceptions dental care is not an organised and regular part of school health service, where the latter exists. On the other hand, surveys recently carried out indicate incidence of dental caries and periodontal disease on an unsuspected scale. The training of dental hygienists and mechanics, so necessary for starting a chain of dental clinics, has made no headway.

The Committee, after having given careful thought to the proposal of the Dental Council for the creation of posts of Advisers or Assistant Directors-in-Charge of Dental Care at the Centre and in the States, takes note of the fact that an honorary Dental Adviser has already been appointed to the Central Ministry of Health. In regard to the State Health Directorates, the Committee feels that in the present state of development of dental health services, it should not be necessary to have full time Dental Advisers or Deputy or Assistant Directors in the State Health Directorates. It is suggested, however, that the Principals of the Dental Colleges in the States where such colleges exist and the senior-most Dental Surgeons in other States, should be asked to work as consultants or Advisers to the Health Directorates on a part-time basis, to draw up the necessary programmes and to see that these are carried out.

At the District level, the Committee considers that there should be a fully equipped and staffed dental clinic as part of the District headquarters hospital. Besides the dental surgeon, it should have a dental hygienist and a dental mechanic attached to it. In addition to this, each district should have a well-equipped mobile dental van, which would visit regularly the taluq and other bigger Centres in the district according to a prescribed programme. This should make it possible to deal with cases referred from the Primary Health Centre, and to carry out dental examination of school children as part of the School Health Programme. It is realised that one Dental Hygienist for the area and population of a Primary Health Centre may be inadequate, particularly if the school children are to be brought under a regular programme of examination. For purposes of preliminary screening of these cases, it is therefore suggested that it will be useful to give some orientation in dental care to the Auxiliary Health Worker proposed to be attached to each Primary Health Centre and sub-centres.

15. Health Services in the Railways

The Director (Medical and Health), Railway Board, Ministry of Railways is the head of the Medical and Health Services and directs, co-ordinates and determines the policy for the control, planning, and development of these services on a uniform basis on all Indian Railways. The Medical and Health Services on each Zonal Railway are under the administrative and executive control of the Chief Medical Officer. He is assisted by a Medical Officer in the senior or junior scale at the headquarters of the Railway, and at the Divisional/District level by the Divisional/District Medical Officers or Assistant Medical Officers-in-charge of the Divisions/Districts, who are in turn assisted by Assistant Surgeons in sub-charge of the jurisdiction under them.

(i) Organisation: The medical and health organisation on the Railways provides through an integrated service of curative and preventive medicine domiciliary and institutional medical care and treatment to over 11 lakhs of Railway employees and including their families and dependents to over 55 lakhs of Railway population. These services are provided through Hospitals, Health Units/Dispensaries and Maternity and Child Welfare Centres, Chest clinics and mobile dispensaries.

The hospital service consists of Central or Base Hospitals at the Headquarters of each Railway, Divisional/District Hospitals at Divisional/District Headquarters and sub-divisional/district hospitals at other important stations with bed strengths varying from 25 to 250 beds. The Railways have at present in all 73 such hospitals with 4,513 hospital beds comprising 3,715 general beds, 475 maternity beds and 323 T.B. beds, including those in chest clinics and maternity homes. A target of 5 hospital beds per thousand employees is expected to be achieved by the end of the Second Plan period.

The Headquarters and the Divisional/District hospitals are in charge of well qualified and experienced Divisional/District Medical Officers, are equipped with modern diagnostic and therapeutic facilities like well equipped operation theatre, X-ray unit, physio and electro therapeutic facilities pathological and bacteriological laboratory, nursing and diet facilities and other ancillary facilities required for the working of the hospitals. The services of Honorary Consultant Specialists of repute have also been made available at all Headquarters hospitals for affording medical facilities at consultant and specialist level to Railway staff and their families, besides the services of whole-time doctors qualified in certain specialised subjects. This facility is being extended to Divisional/District Hospitals also. The sub-divisional/district hospitals with smaller bed strengths are located at important stations and are under the charge of an Assistant Medical Officer or Assistant Surgeon, and are equipped with

facilities for routine management and treatment of common ailments. Lady Doctors are attached to all headquarters and divisional/district hospitals and where there are sizeable Maternity Homes and Maternity and Child Welfare Centres.

At the lowest tier Railways have provided Health Units formerly called dispensaries, at stations where there is a large concentration of staff, location of workshop, loco shed etc., and these are located at reasonable distance from one another so that medical aid can be made available to the staff and their families stationed in the sections in between. Preventive and curative measures are extended from these peripheral units in a synchronised and co-ordinated manner. These health units are in charge of one or more assistant surgeons depending upon the importance of the place and area of jurisdiction. Where there are more than one Assistant Surgeon, the senior Assistant Surgeon is responsible for co-ordination and supervision of curative and preventive work. Where a section is long and isolated, a separate line doctor is provided, for attending line calls. A Sanitary Inspector or Assistant Sanitary Inspector is usually posted at these places, who assists the Assistant Surgeon in the conduct of the preventive work and in looking after sanitation and anti-malaria work. Where malaria is a problem, a separate Malaria Inspector or Assistant Inspectors are posted. Midwives are invariably attached to important Health Units to carry out ante-natal and domiciliary midwifery. Skeleton facilities for institutional midwifery are also provided in the Health Units at stations where the strength of staff justifies such provision and at isolated and remotely situated stations where such facilities are not available close by. Emergency beds and maternity beds are provided at some of the important Health Units. There are at present 468 Health Units, and 651 such beds.

In addition to the provision of full fledged Health Units/Dispensaries, branch dispensaries have also been provided to serve the needs of the residents in isolated and/or remotely situated large railway colonies. Mobile dispensaries in Medical bogie Vans have also been provided for extending medical facilities to the staff and their families, serving and residing at way-side stations and in isolated sections.

In accordance with the provisions of the Factory Act, workshop dispensaries or First Aid Posts are attached to workshops and First Aid Boxes are provided in all workshops, loco sheds and other places of work for rendering immediate first aid to workers.

In order to provide immediate medical aid to the travelling public, Railways have provided accident relief medical equipment in Medical Bogie Vans which are located at convenient local points so that they can

be worked to the site of accidents at short notice and in the shortest possible time. These vans are equipped to undertake all emergency measures of life-saving nature in cases of accidents. In addition accident relief medical equipment in portable containers are provided at important and strategic stations from where they could be easily transported to the site of accident in the shortest possible time, to be made available to the Railway doctor or any other doctor present on the spot to render emergency medical aid in cases of accident. First Aid Boxes, stretchers and wheeled chairs are also provided at a large number of stations and guards of all passenger carrying trains are provided with First Aid Boxes as their personal equipment to render emergency treatment for minor injuries to the travelling public.

(ii) **Special Facilities and Benefits:** The Railways have established Chest Clinics at almost all the Headquarters and Divisional/District Hospitals, where detection of early cases of tuberculosis, examination of contacts, surveillance of contacts and ex-tuberculosis cases, domiciliary treatment and pre-and post-sanatorium treatment are undertaken. A few observation beds are attached to some of the chest clinics at present, and it is proposed to have 10 to 12 beds attached to each of the chest clinics in the Third Plan period.

For institutional treatment of tuberculosis cases the Railways have, apart from the T.B. beds available in Railway Hospitals, made available beds in various recognised T.B. sanatoria/Hospitals by means of either reservation of beds from their own quota or by building a Railway ward as an annexe to the sanatorium/Hospital, for which the Railways bear the entire cost. The Railways have at present 1,173 beds reserved in various recognised T.B. sanatoria/Hospitals.

Dental clinics have been established at Headquarters and Divisional/District Hospitals, and are in charge of qualified full-time Dentists employed by the Railways at Headquarters Hospitals and part-time Dentists paid from the staff Benefit Fund at Divisional/District Hospitals. Attention to oral hygiene and dental treatment of conditions which have a bearing on systemic diseases, except provision of Dental Prosthesis; are undertaken at these clinics.

Maternity and child welfare services are rendered through the Maternity homes and Child Welfare Centres attached to Divisional/District Hospitals and important Health Centres. They are in charge of lady doctors assisted by Health Visitors and midwives who render ante-natal, post-natal and maternity services to expectant mothers. Under-nourished children of Railway employees are given free milk, tonics, etc., through these centres.

A school health service provides for periodical medical examination by Railway doctors, of children of Railway employees attending Railway Schools. Minor ailments and defects are attended to at Railway Hospitals and dispensaries and the parents are advised of the same.

An industrial medical service is provided in bigger workshops dispensaries and/or First Aid Posts manned by a doctor and other ancillary staff which work round the clock where required.

Ambulance services are maintained at all important hospitals specially in colonies which are large and scattered, and at large and important workshop centres for expeditious transport of sick and injured cases to the hospitals.

As a part of the National Family Planning campaign, Family Planning work is undertaken through the agency of staff attached to Health Units and Maternity and Child Welfare Centres.

Health education is imparted through the agency of Health units and maternity and child welfare centres by lectures, holding of health exhibitions and exhibit of films of health education value and demonstration by pamphlets.

Railway doctors in their capacity as workshop medical officers carry out periodical medical examination of employees in workshops, loco sheds and other places of work, who are engaged in hazardous occupation in order to facilitate detection and treatment of workers suffering from occupational diseases. They also inspect these places of work with a view to ensure a standard of environmental hygiene and sanitation conducive to workers.

Railway Medical Officers and Sanitary Inspectors have been appointed as Food Inspectors under the Prevention of Food Adulteration Act 1954 and they exercise these powers in their respective jurisdictions as notified by the concerned State Governments.

The data below bring out the salient points regarding institutional and personnel facilities and the expenditure incurred on health services in the Railways :

Railway Employees	..	11.0 lacs
Population served	..	(55.0 lacs including families)
73 Hospitals	..	4,513 beds
	..	(3,715 — General
	..	475 — Maternity
	..	323 — T.B.)

Emergency beds	..	650	
Dispensaries and Health Units	..	468	
Total cost of Medical and Health Services			6.10 crores.
			Rs.
*Total Medical Staff	..		12.088
**Total Public Health Staff	..		24.592
			<hr/>
Total	..		36.680
			<hr/>
Beds to Railway population	..	0.9 : 1,000	
Doctors	..	1 : 3,710	
Population per hospital	..	81,220	
Percentage of Health and Medical Staff to Total Railway Staff	..	3%	
			Rs.
Per capita cost of medical staff	..	33.3	
Per capita cost of Public Health staff	..	25.6	
			<hr/>
Total	..	58.9	
			<hr/>
*includes Chief Medical Officers	..	8	
Divisional/District Medical Officers	..	62	
Assistant Medical Officers	..	83	
Assistant Surgeons	..	1,435	
**includes Divisional/District Medical Officers	..	8	
Assistant Medical Officers	..	2	
Assistant Health Officers	..	2	
Malariologist	..	1	
Assistant Malariologists	..	4	

(iii) Recommendations: It will be apparent from the above account that the Railway personnel are served better in terms of medical care, institutional facilities, per capita expenditure etc. than the civilian population generally. Although the service is an integrated one it seems that the emphasis continues to be largely on medical care and preventive services do not get the attention that is due to them. We feel that in an organised service like the Railways it should be feasible to subject all employees to periodical physical examination instead of the latter being confined to the industrial workers only.

The Railways are responsible not only for the health of their employees, but as a public utility service, also for that of the general public that make use of the service. The use of the railways by patients suffering from infectious diseases seems to be going on in an unrestricted manner. Patients suffering from leprosy not only freely use the railways but also make a nuisance of themselves in railway trains and on platforms by begging. It is therefore necessary to provide checks against such practices. The regular cleaning of railway carriages, the inspection of food and the manner of its vending on the platforms as well as in the refreshment rooms require stringent control.

The Public Health staff obviously requires to be strengthened at all levels. It would also appear to be necessary to reinforce the staff at the level of the Chief Medical Officer and the District Medical Officer by an officer whose duty it should be to help the respective officer in public health work by devoting his attention exclusively to preventive work. It is only then that proper supervision could be exercised over the field sanitary staff and that Assistant Medical Officers and Assistant Surgeons will be subject to the guidance and check that is necessary to induce them to give greater attention to the public health aspect of their work.

There is another aspect of the Railway Health Administration to which we would like to draw attention. The Railway Health Service exists at present as a completely independent entity, with its own separate recruitment, cadres, hospitals and specialist facilities. While recognising that the organisational set up of the Railway Health Service must have a pattern of its own, suited to its peculiar needs, there appears to be no reason why it should continue to remain in a water-tight compartment. Firstly with regard to its medical personnel the advantages of a common cadre with the other Central Health Services far outweigh the possible drawbacks of such an arrangement. The diversity of experience of the members of a Central Health Service should prove useful to the Railway Health Service and vice versa. The wider field of work and correspondingly larger prospects of promotion should enrich the service rather than lower its standard. It appears to us therefore that it is time that the Railway Health Services should draw upon the pool of a Central Health Service for its medical personnel, while retaining otherwise the administrative structure of its Health Services in general.

The Railway system grew up in this country as a private venture and individual companies themselves naturally recruited their own staff. There is no reason why with the nationalisation of the Railways the separate existence of a railway medical service should continue to be necessary and why a central pool of health service could not provide the medical personnel for the railway services.

As far as specialist services are concerned the effort of the Railways has been to provide their own specialists. Lately the practice of using specialists in the private profession on the basis of an honorarium has been resorted to. Since Railway hospitals where specialist consultation/services are generally required are situated in the bigger cities where Government hospitals and specialists are available, it should be possible to make suitable arrangements for the advice and assistance of such specialists being made available to the Railway hospitals as and when required and vice versa. Such an adjustment would obviously be facilitated by the common cadre that we have suggested above.

16. Medical and public health facilities in factories, coalmine areas and other major projects

The question of industrial health has received considerable attention since the publication of the Bhore Committee's report. The following legislative measures may be cited as instances of the steps taken for the improvement of social security measures for industrial workers.

1. Mica Mines Labour Welfare Fund Act, 1946
2. Coal Mines Labour Welfare Fund Act, 1947
3. Industrial Disputes Act, 1947
4. Coal Mines Provident Fund and Bonus Act and Schemes, 1948
5. Minimum Wages Act, 1948
6. Factories Act, 1958.
7. Employees State Insurance Act, 1948
8. Dock Labourers' Regulations, 1949
9. Plantations Act, 1951
10. Mines Act, 1952
11. Provident Fund Act, 1952
12. Workmen's Compensation Amendment Act, 1959.

The Factories Act 1958 was a notable improvement on the old 1943 Act and included about 40 new sections covering such important subjects as disposal of wastes and effluents; dust and fume; provision of the spittoons; welfare provisions regarding washing facilities, facilities for storing and drying clothing, facilities for sitting, first-aid appliances, canteens, shelters, rest rooms and lunch rooms, creches, welfare officers and various sections dealing with annual leave with wages and notice of certain notifiable diseases (17 of them).

Legislation regarding transport and agricultural workers on the same lines has not come into existence. The Labour Ministry has now a Chief Adviser, Factories, under whom there is a division of industrial

hygiene. Investigations on a number of health problems in the various industries have been undertaken by this organisation. The Industrial Health Advisory Committee of the Indian Council of Medical Research as well as the industrial health unit of the All India Institute of Hygiene and Public Health have also contributed to research in industrial health. The latter institution also provides a nine-month course in industrial health which has been taken so far by over 150 doctors and also a short-term three-month certificate course. The Bombay University also offers a three-month certificate course in industrial health. Training has also been received in industrial and occupational health by more than 40 factory inspectors in commonwealth countries. Appendix B-8 summarises the position with regard to the implementation of the Factories Act and administrative organisation in the various States in this regard. Although medical inspectors of factories have not been appointed to the extent anticipated, there are at present 7 medical inspectors of factories in the States of West Bengal, Bihar, Punjab, Maharashtra and Gujarat. The improvement of the housing conditions of the workers in the factories and mines has been carried out to some extent under the subsidised housing schemes. Studies in nutrition have also been made by the Nutrition Research Laboratories. The problem of rehabilitation, vocational guidance etc. has, however, not received the attention that it requires.

Some members of the Committee had an opportunity of seeing *for themselves the health services in coalmine areas, the Nagarjunasagar project and the Durgapur Steel Plant.* The observations made by them are given in Appendix B-9.

Recommendations

Special services should be available for hospital, domiciliary and clinic care of workers. As far as possible, there should be separate hospitals for the Insurance patients except when specialist treatment is required. Persons included under State or Central Government or quasi-Government institutions should as far as possible have their own hospital services as otherwise the average citizen has no opportunity to avail himself of the existing Hospital facilities. There should be no discrimination whatsoever in the existing government institutions between a Government servant, insured patient, or a civilian patient.

17. Health Care Facilities in the Plantations

Extensive tea, coffee, rubber and other plantations are scattered over different parts of the country employing a sizeable number of workers. Although the owners of some of the plantations were progressive and took good care of the health of the workers, by and large the ameni-

ties provided in the plantations in general were extremely poor and inadequate. There were until the beginning of the last decade no legislative measures requiring the provision of certain minimum services for the workers. The fact that in many cases the labour was employed seasonally and that it was cheaply available made it possible for the employers to disregard the essential needs of health facilities for their workers. Not long after the Second World War, the Government of India deputed Dr. Lloyd Jones of the Directorate General of Health Services to make an assessment of the standard of medical facilities available in plantations and to prescribe satisfactory standards where necessary. The report submitted by Dr. Lloyd Jones recommended the enforcement of statutory standards by legislation. The *Plantation Labour Act* thus came into force in 1951 which provided, among other things, for the minimum standards of medical facilities in the plantations. Statements in Appendix B-10 give the population of the plantations in the various States and the medical facilities provided for them as well as the comparative picture of facilities available to the plantation workers as against the population in general. The tea industry itself provides employment to more than one million workers in the country. In spite of the fact that the medical care facilities are of a higher standard than what is available to the population in general, absenteeism in the tea estates has a high incidence particularly on account of sickness. Dr. Lloyd Jones, in his report referred to above, pointed out that the drawback in the tea plantations is not so much the lack of hospitals and specialist facilities as the lack of public health measures and facilities for medical care in the gardens themselves. The general low level of nutrition, inadequate sanitation and insufficient or unwholesome water supply were the main causes for the low state of health instead of the non-availability of medical facilities.

The obligation to provide housing, medical care and other facilities to the labour population has been made mandatory by the *Plantation Labour Act, 1951*. Effective arrangements are required to be made by the employer to provide and maintain at convenient places sufficient supply of wholesome drinking water for all workers, a sufficient number of latrines and urinals of prescribed types are also required to be provided and maintained in a sanitary condition. The State Governments are authorised in the case of default by the employer, to provide the necessary health facilities, if necessary, and recover the cost from the employer. The *Plantations Labour Commission* found that not all the plantation employers had been able to provide medical facilities to the extent prescribed under the *Plantations Act*. It has been claimed that as the result of the improvement in the medical and other facilities now available to the plantation labour much of the floating population of the tea plantations has become static. It has also been claimed that the

medical facilities available are of a much higher order than what is available to the neighbouring population not employed in the plantations. The sickness rate, the attendance at the hospitals, the per capita expenditure on medical care, etc. are cited as examples of the increasing welfare approach on the part of the employers. A plea has therefore been made that insistence of still higher standards being maintained by the plantations will, on the one hand, give rise to increasing disparities between the facilities available to the plantation labour and to the general public, and on the other, add heavily to the overheads of the plantations, which as it is, are economically not quite prosperous.

Here, as in other places, the emphasis has largely been placed on providing extensive medical care facilities, without paying appropriate regard to the needs of preventive health services. In some of the plantations, especially where the managements have pooled their resources, services of a high order are available and it has been claimed that the general and infantile mortality in some of the plantations has been brought down much below the level of the mortality rate of the populations in general. In the majority of the other plantations, however, sanitary facilities, facilities for health education, immunisation programmes which could be introduced without very heavy financial outlays, have not been carried out on the required scale. The enforcement of the provisions of the existing law does not also appear to have been as vigorously carried out by the State Health Departments as might have been done. The reason for this perhaps lies in the location of these plantations coupled with the inadequacy of supervisory health staff of the *Public Health Departments*.

18. Health Services for Defence Services and co-operation between the Armed Forces and Civil Medical Services :

The Medical Nursing and Dental Services in the Armed Forces collectively consist of the Medical and Dental Officers including those seconded to the Navy and Air Forces, officers holding non-technical commissions for non-professional administrative duties in the Armed Forces, the members of the Nursing and Dental Services, and the Junior Commissioned Officers (JCO), Other Ranks (OR) of the Army Medical and Dental Corps together with their equivalents in the Navy and Air Force.

(i) **Integration of Medical Services :** The most significant event during the post-war period is the integration of medical services of the Army, Navy and Air Force under the Director-General, Armed Forces Medical Services, for proper central direction of research, control and co-ordination of technical training of officers, JCOs and ORs. The Direc-

tor-General, Armed Forces Medical Services, took over all the duties of Director-General, Indian Medical Service, which concerned the Medical Services of the Armed Forces. It was envisaged at the time of integration that the wider problem of integration by close collaboration with civil services should also be aimed at in the years to come. Giving military training to civil medical officers was also contemplated and progress in this direction has been made by the recent provision for 20 civilian medical officers from State Governments per year to be on deputation for three years in the Armed Forces. This Scheme will enable better understanding between the civil and military medical services. The officers so trained will also be valuable assets to cope with any civil emergency like famine, pestilence and epidemic diseases.

In recent years, the families of the Armed Forces personnel have also been taken care of in the medical institutions which are run by the Defence Forces.

Medical statistics, standardisation of forms for vital statistics, compilation, collation, and analysis were also integrated under the Director-General, Armed Forces Medical Services, recognising the highly technical nature of medical and research statistics.

The scale of General Duty Medical Officers, Specialists and Nursing Officers authorised in the Armed Forces hospitals at present, is still inadequate. The General Duty Medical Officers are authorised approximately on a scale of 1 per 50 beds and hospital specialists are found from a pool of about 300 officers. Nursing Officers are authorised at 1 per 20 beds only which is very much below modern concepts of nurse-beds ratio. The deficiencies of specialists have been made up largely by systematic training of selected candidates in the Armed Forces Medical Corps and several other external institutions under the study leave schemes. The deficiency of Nurses has also been made up through the Probationer Nurse Schools, but limitations of accommodation have precluded the training of more nurses.

The Armed Forces Nursing Council has been established on the lines of the State Nursing Councils.

(ii) **Surgical Centres:** The war wounds brought out certain special requirements in Orthopaedics, maxillo-facial and traumatic surgery, rehabilitation, physio-therapy, resuscitation and blood transfusion. Officers had to be systematically selected and trained to supplement the small number of specialists who were available at the outbreak of war.

Separate orthopaedic centres had to be established during the war to cope with an ever increasing rate of bone and joint injuries. Since-

partition, such a centre has been functioning in Poona/Kirkee under well-qualified specialists. The centre is designed to tackle practically every orthopaedic condition and has done very useful work. Great emphasis is also laid on traumatic surgery.

A Maxillo-facial surgery centre was established in Poona in the local military hospital in 1949. Lately the Dental Services have been very closely associated with the unit. A neurosurgical Centre has also been organised for duty with one of the Command Hospitals. In addition to the above, a Thoracic Centre has also been established at Aundh.

(iii) **Artificial Limb Centre (ALC) :** An Artificial Limb Centre has been developed at Poona, and is under the administrative control of the Director-General of Armed Forces Medical Services. From small beginnings in 1944 as an Army Unit, this Centre has steadily established its usefulness and reputation, as not only an Armed Forces establishment, but as an institution of national importance. It is the only institution of its kind in the East, and it is the fourth largest Centre in the world. The Centre has a composite staff drawn from the Army Medical Corps, (AMC), Electrical and Mechanical Engineers (EME) and civilian technicians. A number of them have undergone training in U.K. since 1945 and they have by now achieved considerable experience in limb-making. The centre caters for the needs of Army personnel and civilians. Demands from neighbouring countries like Burma, Ceylon and Iraq are also met. More than 1,500 civilians and foreign nationals have been fitted with artificial limbs. During the last three years the Centre had manufactured nearly 4,000 limbs.

A hostel for amputees has recently been provided, where the amputees can be retained for training in the use of such limbs and is of great help to civilian patients.

The Artificial limb Centre can also design prototypes of instruments. Civilian specialists can make use of this centre in the design of new instruments and equipment.

(iv) Blood Transfusion :

The Blood Transfusion Department of the Armed Forces Medical College manufactures and supplies all resuscitation fluids for the Services. It also runs a blood bank for Service hospitals in Poona and manufactures dry plasma and blood grouping sera for the Services. It is responsible for the preparation and assembly of all transfusion sets for supply to medical units of the Services. Research into the various aspects of this speciality has been in progress in the department since

effort is being made to procure indigenous items, but even now a substantial proportion of stores are imported from U.K. and U.S.A. Vaccines and sera are procured from the various institutions in India, namely Haffkine Institute, Central Research Institute, Kasauli and such other civil establishments.

Strict quality control is maintained by trials and inspections. Before introducing an item, its usefulness for the Armed Forces is carefully assessed by a 'Technical Panel Committee in the Director-General, Armed Forces Medical Services' office with the Director of Medical Research as the Chairman. The development of new equipment and modifications to existing patterns are done by a Development Sub-Committee.

The Armed Forces Medical Store Depot, Poona, is responsible for the provision and maintenance of electro-medical equipment to the Armed Forces. It has also got technical staff who visit the various Military Hospitals and carry out repairs to such equipment. There is a great shortage of maintenance staff in all civil hospitals in India and great many expensive pieces of apparatus, such as X-ray, electrocardiograms etc. are lying unused for want of maintenance and technical know-how. If the technical staff is augmented, it should be possible for the Armed Forces Medical Store Depot staff to visit civil hospitals and undertake the repair and maintenance of X-ray equipment whenever required on payment.

In towns which are not served by civil hospitals but in which there are military hospitals, the prospects of opening a wing in these hospitals for civilian patients can be examined. Similarly, in military stations where there are no military hospitals but in which civil hospitals exist, the latter could provide for a wing for the treatment of military patients. Moreover in stations where there are military as well civil hospitals, some arrangement for the inter-change of medical staff could be examined.

There is a great shortage of medical officers to supply the basic needs of the Armed Forces. Although this applies equally well to the country as a whole, it is essential to realise that soldiers who are guarding our frontiers in inaccessible places should have adequate medical cover. It is admitted also that a spell of duty with the Armed Forces gives the young doctor self-confidence, discipline, experience of management and administration which should be of great value to him in his later life either in State service or in private practice. In all countries of the world except in India doctors are liable for conscription. Although this may not be feasible in this country there appears to be no reason why doctors in State service should not be required to

serve for a period of, say, 3 years in the Armed Force, this service being counted for purposes of seniority and promotion when they revert to their State service. This condition may be embodied in the terms of recruitment to Central and State Medical Services.

(viii) Station Health Organisation :

Every Garrison Station has a Station Health Organisation to deal with the health problems of the garrison. It is suggested that their technical knowledge may be made use of by the nearest Primary Health Centres or National Extension Service Blocks in improving the health conditions, provided adequate facilities for their transport can be made available by the civil authorities.

(ix) Interchange of Medical Officers :

Specialists in the Armed Forces are highly qualified in many specialities and it will be of great advantage if there could be an interchange of these specialists with specialists on the civil side, so that all the specialists get experience in both army and civil practice. Further their standards of discipline and administration will be of great help in re-organising their departments on the civil side. Such interchange could be for limited periods and it will be to the advantage of the civilian specialists also to get an experience of how the army requirements are met.

19. Employees State Insurance Scheme

We have had the advantage of seeing the working of the Employees State Insurance Corporation in some centres, notably in Bombay, Calcutta and Hyderabad. We have also had opportunities of reading the report presented by the Chairman of our Committee on the Employees State Insurance Scheme which was drafted at the request of the Ministry of Labour, Government of India. We, therefore, feel that relevant extracts from the report may be studied in connection with this report. This will be found in the Appendix B-12 but so far as the main recommendations are concerned we feel that the following points should be duly taken note of.

The Employees State Insurance Act, conceived as it has been for the welfare of the employees and incidentally to improve their work in the factories, is a step in the right direction. It is in the working of the Act and the spirit in which the several measures conceived thereunder are implemented that the success of the Act will ultimately depend. In the light of the experience gained during the past few years since the Act was brought into force, it seems necessary that some urgent steps should be taken and, for this

purpose, a greater amount of co-operation and co-ordination than exists at present is necessary.

The Corporation, being a centralised body, will not be in a position to look after the Scheme in the various States effectively unless a certain amount of decentralization of functions and responsibilities is introduced. At present, it has been brought to the notice of the Commission that even in regard to some small details, reference has to be made to the Head Office of the Corporation and it has been represented that this inevitably results in delay. While the broad principles governing the administration of the Act must be those which are arrived at in consultation with the States by the Corporation, in the actual implementation of these principles the States must assume a greater amount of responsibility and must take a greater amount of interest. It is impossible for this Act to be administered unless the States' responsibility is realised and full co-operation is obtained from the States.

As in the Centre, so in the States there is greater need for not merely co-operation but for an intensive linking-up of the efforts between the Ministry of Labour and the Ministry of Health of the State concerned. The efficiency of medical treatment can be ensured only if that close linking-up were maintained. The Regional Boards no doubt have the head of the Department of the Medical Services of the State as a member, but it would be desirable to have the Minister of Health and the Secretary to the Department also take an active interest in the working of the Employees State Insurance Scheme.

The States have no doubt realised that in the Employees State Insurance Scheme, they are in a position to get the help of the Corporation for the medical treatment of a large number of employees who are undoubtedly citizens of the respective State entitled for such benefit as ordinary citizens. The relief given to the State therefore through the Corporation must be utilised to the full benefit of the employees.

Emphasis has been laid on the urgent necessity for the construction of hospitals in various places and for the manning of these hospitals entirely by the Employees State Insurance medical staff, except that in the case of some highly specialised methods of treatment, the services of the specialists in the State may be requisitioned under definite conditions. It has been suggested that the hospitals need not be centralised in any one locality but depending upon the city or town concerned, there can be more than one hospital as for instance in Calcutta and Bombay where the employees can find it possible to obtain hospitalization. The urgency for hospital construction is even greater when it is realised that there is a great deal of pressure to include families in the scheme of medical benefit. The hospitals therefore should have facilities for treat-

ment of medical, surgical, obstetric and gynaecological cases together with all the diagnostic facilities necessary and provision for certain specialities to be treated, if possible, in the hospital itself.

On the scale of beds for different categories authorised by the Corporation, the overall number of beds works out to 2.5 beds per 1,000 employees. It is understood that in-patient treatment under the Scheme at present is authorised only for insured persons and the families of insured persons are entitled to receive restricted medical care, i.e. out-patient treatment and domiciliary confinement. When the Scheme is extended to all areas with insurable population of 1,000 and above, it is expected that about 24 lakhs of employees will be covered under the Scheme. The number of beds required in the various States for in-patient treatment of insured persons only is estimated to be about 6,340. With the inclusion of families of insured employees, it will be obvious that the position is indeed very unsatisfactory and requires immediate attention.

It has been pointed out that many of the so-called panel dispensaries function under such adverse circumstances that they cannot be called dispensaries, that very few facilities are available even for ordinary methods of examination and that, if unfortunately the same dispensaries were to be utilized for families also the conditions would be deplorable. It is, therefore, very necessary to build what has been called polyclinics where 7 or 8 panel doctors may attend to the employees entrusted to their care and where a couple of service doctors will be in charge and can be assigned some employees for medical care and where technicians will also be available for some of the laboratory tests. Where families are to be included, one of these doctors must be a lady doctor and it is suggested that at least two service doctors permanently attached to these polyclinics must have quarters so that they may be available for emergency cases.

It is not proposed to enter into a discussion as to the relative merits of the panel system and the service system but it has to be pointed out that the panel system requires great improvement and that the panel doctors, while being given all facilities to utilise their knowledge, should see to it that their terms of appointment are strictly complied with. Laxity and irregularity in attending the panel clinics and the poor set-up of the clinic itself cannot be over-looked under any circumstances. To the extent to which panel practice has to be continued, it has been suggested that a panel practitioner should be appointed for a maximum period of 3 years and, subject to satisfactory work, the practitioner may be continued for further similar periods. In some States where honorary medical officers are employed in the hospitals,

definite hours of work have been in vogue while they are paid no honorarium or compensation and such honorary medical officers and assistant medical officers are appointed for a period of 5 years and are eligible for re-employment if found satisfactory. If polyclinics and dispensaries of this nature are constructed and utilised, there will ultimately be a great deal of saving, as there would be no necessity for separate diagnostic centres or for recognising certain drug stores as places where the medicines should be obtained. The polyclinic itself can store all available medicines which are to be given and dispense them to the sick employees so that they need not go to drug shops or in the majority of cases to diagnostic centres. It would also be conducive for specialists to visit these dispensaries at particular hours to offer any specialist advice needed.

There has been a steady increase in the number of persons included under the Employees State Insurance Scheme. Therefore it has been suggested that immediate steps should be taken in all cities where large industries are being established to acquire land in excess of the immediate requirements so that ultimately the hospitals or dispensaries may be suitably remodelled to accommodate the increased number of persons.

In regard to construction of hospitals and dispensaries, while a sketch plan may be prepared at the Centre, it should be left to the States concerned within the limits prescribed about the total areas, etc., to construct such buildings as are best suited to the locality concerned. It will not be suggested by anyone that a type-design which will be suited to some of the Southern States in India will be as well suited to Assam, Punjab or some of the northernmost States.

Whether these hospitals and dispensaries should be constructed on a loan basis or out of contributions by the Corporation is a matter to be settled with each State; but it is important to stipulate that such hospitals and dispensaries should be utilised for those who come under the Employees State Insurance Scheme.

It was noted that in the most crowded locality of Delhi, the ground-floor of a particular building which was dark and dingy was being utilised as a dispensary, two large rooms thereof being considered adequate for housing in-patients. The whole set up of the dispensary gave a rather dismal picture of what the employees had to go through and when it was stated that this small part of a storied building was rented for Rs. 2,000 per mensem, one could not help feeling that with the amount expended during the last three or four years, it would not have been difficult to have built an insurance hospital or

more than one polyclinic for the permanent use of the Corporation. We strongly advise that wherever rented buildings have been used, every effort should be taken to construct immediately new hospitals and polyclinics.

It is necessary for a small committee to visit all the important centres immediately and, within 3 months, draw up in association with the States a scheme of hospital construction and polyclinic construction and high priority should be given to these buildings so that within a period of 2 years, the Corporation would have extended its hospital facilities and provided for much better out-patient treatment in the polyclinics suggested.

A recommendation has been made that so far as the sickness benefit is concerned, it may be extended for certain special diseases. It has also been suggested that the local and sub-local offices for giving sickness benefit must be increased in number so that a large number of employees may not have to congregate and wait for a long time to get this benefit. Wherever possible, such offices may be located either in large industrial units or very close to such industries so that the bulk of the employees may not have to spend much time in going to those offices.

Domiciliary visits are expected to be paid, but in actual practice, it is not surprising that the difficulties for domiciliary visits under conditions in which the employees are housed in the various localities make such visits almost impossible. Moreover, it has to be emphasised that it is not the curative part of sickness that is most important but the preventive aspects for the preservation of health and this can only be ensured if proper public health facilities are available and if the doctors responsible can look after the public health aspects of the insured persons including their families.

One of the urgent requirements to be taken up is the proper housing of all employees and till this is ensured, full benefit of the Scheme will not be possible.

It has been stated that the employers' contribution in the implemented areas is on a different rate from that in the non-implemented areas. There has been a good deal of criticism about the delay in implementing the scheme in non-implemented areas. It would therefore appear that the next immediate step should be to extend the Scheme to non-implemented areas where employers are making their contribution. It may be mentioned in this connection, that in Calcutta strong objection was raised by the employees' trade union representative to the extension of the Scheme before all the families of the employees already

insured had been included. In the conditions under which Calcutta is now functioning with its complex health problems, we cannot fail to appreciate the vehemence of the stand taken.

20. Contributory Health Service Scheme

The Contributory Health Service Scheme functioning in New Delhi also requires reorientation with regard to preventive and promotional care. It has been found in Delhi that each beneficiary (4.5 lakhs) falls ill 3 times a year and nine days are lost per year. The admission rate to hospitals is 2.9 per cent of which 1.6 per cent is for maternity. The average cost per person is Rs. 12 per year and the average cost per family is Rs. 54.37 per year. The expenditure is about Rs. 50 lakhs and contribution is about Rs. 25 lakhs, the balance being subsidised by the Government. If preventive care and promotional health is added it may be possible not only to reduce the expenditure but also, in the long run, contribute towards the better health of the people. At present there is an over-emphasis on the curative service and bottles of medicine. Whether to extend this scheme to other parts of India or merge it with State Insurance should be seriously considered.

21. Life Insurance Corporation

There is a need for the Life Insurance Corporation encouraging their insured to have Health check-up periodically to promote health and prevent disease and to diagnose disease in an early stage for early treatment. It is recommended that the Life Insurance Corporation should develop Health Centres or Polyclinics for its insured in different cities and towns which will greatly contribute towards the attainment of better health by a good section of the population and indirectly prove advantageous to the rest of the people.

22. Tribal and Backward Areas

The various tribes in this country account for the sizable population of over 20 millions. These tribes are scattered in different parts of the country and live in hilly and dense forests with very poor means of communication. The major concentration of the tribal areas is in the following regions :—

(1) The NEFA and the Nagaland borders of Assam. These tribes constitute a total population of over 3.5 millions.

(2) The contiguous areas of Bengal, Bihar and Orissa. The tribes inhabiting this area make up a total of over 8 millions.

(3) Tribal groups found in parts of Uttar Pradesh, Madhya Pradesh and Andhra Pradesh. These account for a population of over

4 millions. Although scattered over large areas, these tribes show racial and cultural similarities.

(4) The tribal areas of Maharashtra and Gujarat with a population of 3-4 millions. Besides the above tribal population, small tribal groups are to be found in Madras, in the hilly regions of Himalayas and other parts of the country.

Until recently these tribes were left very much to their own resources and the tribal areas thus came to be islands which stopped moving with the stream of life in the rest of the country. The continuance of such a state of affairs was not only felt to be inconsistent with the position of the tribals, as citizens of a free country, but was also a danger to the health of the neighbouring areas. Very intensive developmental activity has therefore been undertaken in these areas after independence. Apart from general public health and medical relief measures, a yaws control programme was one of the major activities undertaken in the early nineteen-fifties in the tribal areas of Andhra Pradesh (Hyderabad), Madhya Pradesh (Central Provinces), and Orissa, with the assistance of the World Health Organisation. Other public health activities in the form of communicable disease control programmes, facilities for improved medical care, setting up of primary health centres as part of the community development activities have since been undertaken in these tribal areas. As a matter of fact health workers have not infrequently served as the spear-head of the movement for the establishment of settled administration in many of these areas. Even to-day there are areas where the doctor as a representative of the Government of the country is welcome even when the presence of others is resented. While the major public health problems of those areas are those of lack of safe water supply and other hygienic amenities, diseases like malaria, tuberculosis, venereal diseases, leprosy, goitre and nutritional disorders constitute the main bulk of the health problems. The problem of tackling these conditions is made difficult by the sparseness of the population, the inaccessibility of habitations with little or no means of communication and the primitive voodooistic outlook of the majority of the tribes to disease. The village doctor and the village medical man hold sway and propitiation of spirits is the only accepted means of overcoming sickness. It is therefore of the greatest importance that over-zealousness in providing scientific medicine should not lose sight of the attitudes of the tribes. It is important that the village medicine man be treated as an ally by the health worker rather than be made to feel a rival. It must be noted in this connection that in some of the tribes quarantine measures are voluntarily applied on the out-break of an infectious disease in a manner which would do credit to any modern health administration. There are

other patterns in the life of these communities which need to be preserved and encouraged. To that extent we entirely endorse the view of the Adviser on Tribal Affairs that the so-called civilising influences need to be extended to the tribal people with judgment and discrimination, so as not to do violence to certain cultural patterns which are peculiar to the tribes and which need to be preserved.

It also needs to be realised that the normal patterns of health services applicable to other areas may not be practicable in the tribal areas. Instances of the requirements of malaria eradication or of BCG vaccination may be mentioned as examples. In extending such programmes to these areas the local conditions and peculiarities must be taken into account before applying the general pattern of the health programme.

It was brought out strongly to the members of the Committee who visited some of the tribal areas that one of the greatest and most basic needs of these areas is the training of the tribals themselves as health workers. A great deal of this work is so far being done by outsiders. It is not always possible to get them, to retain them for any length of time when they are available, and to establish requisite rapport between them and the local population because of difficulties of language, ways of life etc. etc. Besides this, the presence of a large number of outsiders in tribal areas has posed problems of housing, of provisioning and even of portorage. One of the most urgent needs of tribal areas is therefore that of expanding training facilities so that health assistants, nurses, lady health visitors, sanitary inspectors, laboratory technicians etc. are trained locally from out of tribal candidates. Fortunately educational facilities are being expanded at a fairly rapid rate in most of these areas and if suitable training facilities for health workers are instituted, the requisite number of trainees should be forthcoming from out of the products of the schools. Here again the standards of basic education etc. applicable in the rest of the country should not be insisted upon at least for some time to come. We suggest that the training centre at Passighat in NEFA should serve as a model and similar centres should be set up in all tribal areas to meet the needs of a population of 5 lakhs.

In regard to doctors, there are difficulties in manning the posts inspite of the liberal allowances offered. In the NEFA area out of about 100 posts of Assistant Surgeons Grade I and II, we found over 25 lying vacant. In the medical cadre attached to Assam Rifles out of 111 posts of doctors nearly 80 were unoccupied. It is suggested that suitable tribal students should be selected for training as doctors while at school and be trained by the State in medical colleges on the condition

that they will serve the tribal areas after they get qualified. Besides this, the tenure of duty in the tribal areas should be made compulsory for the members of the Central Health Service in respect of NEFA and Nagaland and for the respective State Health Services for the other tribal areas.

A brief statement with regard to the health conditions in NEFA, Nagaland and some tribal areas in Madhya Pradesh will be found in Appendix B-11.

23. Private Medical Practitioners and their role in Medical care

Till such time as a National Medical Service could be evolved, we feel that every effort should be made to secure the services of all medical men, whether they are private practitioners or employed in various other agencies, for the preventive aspect of medicine, and in some cases for the curative side also. At present there seems to be a limitation in the role of the private practitioners in these two regions. We are glad that in many States private practitioners are utilised in the larger hospitals either as honorary medical practitioners or Assistant Medical Officers or Medical Officers doing part-time service and being paid part-time emoluments. We have elsewhere said that these medical officers, if they have all the facilities and qualifications, must be encouraged to do part-time service in teaching thus solving to some extent the problem of finding a very large number of well-qualified teachers for medical colleges. Further, we feel that private practitioners who are engaged in private practice should be given opportunities for collaborating with any scheme that may be started to render medical care, and in times of epidemic, their services should be availed of under conditions that are acceptable to them, so that a large army of medical men can be turned over to the effective eradication of diseases like smallpox. It has already been pointed out that so far as rural medical relief is concerned, we feel that the part-time services of private practitioners as well as the retired persons could be utilised advantageously to supplement what may be called the rural medical staff. We also feel that there should be closer co-operation between the private practitioners and the medical personnel that are serving in the hospitals, so that there may be a free exchange of ideas regarding the patients who are admitted in the hospital. It should be ensured, however, that so long as the members of the private profession participate in this endeavour, their standard of performance should be the same as that of the regular medical staff and while the hours of work and other conditions may differ, the requisite amount of care necessary should always be available.

We would suggest in this connection, that the same policy should be followed in respect of Dentists, Nurses and para-medical personnel.

Curative medical care except in the case of communicable diseases and mental disorders has been rendered chiefly by panel practitioners and voluntary organisations in Great Britain and several European countries. The National Medical Service of the United Kingdom and the almost universal insurance medical protection of the Scandinavian countries had their beginning in this way.

In India, on the other hand, curative service has almost wholly been a governmental responsibility and most of it has been given free of charge. Insurance medical service has also been built up on the pattern of public service. Financial limitations stand in the way of a rapid extension of this service to the entire population. For the establishment of such a service all wage earners and other income groups will have to be progressively brought under the health insurance scheme and the insured, as well as the indigent population must be provided with a certain minimum uniform standard of medical care, with special facilities like pay wards for those who can contribute towards the cost of such facilities. For such a scheme utilisation of the entire medical manpower of the country will be necessary through a proper co-ordination of the services of the personnel of health authorities and of independent practitioners. It is recognised that this will only be a transitional phase in the national programme of health development and that with the full evolution of this programme almost the entire medical manpower (except perhaps some of the top-ranking consultants) will become absorbed in the health service of the country.

In the transitional period, independent medical practitioners have to be considered as a separate entity whose efficiency should be preserved and whose legitimate interests must be protected.

It may be noted that 40-70% of doctors in the different States are private practitioners. Although in most States a large number of posts in government service remains vacant, many young doctors elect to settle down in cities, in the hope that while retaining their "independence" they can eventually become successful practitioners. In relevant sections of this report it has been indicated how independent medical practitioners can be utilised on a part-time basis for the furtherance of health programmes and hospital work. Their efficiency and contentment therefore deserve special consideration. The following measures are suggested with that object in view :—

(1) Their scientific outlook and professional skill should be kept up-to-date by free refresher courses, periodically ;

(2) Apart from free laboratory service in communicable diseases, other kinds of laboratory as well as X-ray service should be made available to them at actual cost ;

(3) They should be given opportunities to serve in Government hospitals and dispensaries on a part-time or honorary basis ;

(4) The hospital authorities should encourage them to admit in the hospital their patients needing in-patient care ;

(5) Their services should be utilised in schemes like Employees State Insurance, mass immunisation, school health service, family planning, etc. ;

(6) Measures should be adopted to eliminate quackery — quacks are not only a danger to the public but also stand between medical practitioners and their patients ;

(7) The advertisers and the canvassing agents of manufacturers of drugs also act like quacks in this respect. They mislead and encourage the public to treat themselves, often with dangerous drugs. Advertisement in the lay press should be prohibited ;

(8) Dispensing of patent medicines, especially poisons except on the prescription of qualified medical practitioners, should be made a penal offence ;

(9) In the subsidised medical practitioners scheme the dispensaries should be situated within a reasonable distance — not more than five miles from the villages to be served.

CHAPTER VI

PUBLIC HEALTH

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Bhole Committee recommendations, present position and our recommendations on :—

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(1) Definition

The Bhore Committee in Volume I of their report stated "The term health implies more than an absence of sickness in the individual and indicates a state of harmonious functioning of the body and mind in relation to his physical and social environment, so as to enable him to enjoy life to the fullest possible extent and to reach his maximum level of productive capacity. In every community there are three classes of persons, namely, those whose level of health is so low that they are victims of disease, others who, while they manifest no definite signs of sickness, are yet so devitalised that the possible range of their physical and mental achievements is considerably restricted and a third class consisting of those who are blessed with an abundance of life and vigour. An assessment of the state of the public health in a country should, therefore, be based on information relating to all these three classes of people."

In the early stages, activity in the public health field was restricted to environmental hygiene, but as time passed personal services, particularly for mothers and children, the school-going population, parents suffering from infectious diseases etc., were also included in its ambit.

"Health is not necessarily the product of a monolithic organisation but is the resultant of a number of forces some directed specifically at improving mental and physical well-being, others widely removed from the scientific disciplines of preventive and curative medicine but nevertheless collateral and contributory to the main purpose." An ideal public health service will, therefore, include not only environmental sanitation, personal health, community health, control of communicable diseases, vital research, but also social welfare and social security, insurance, labour standards, food production, recreation, family planning and many others.

(2) Constitutional provision — General

We may well refer to the Directive Principles of the Indian Constitution which inter alia mention that :—

"The State shall, in particular, direct its policy towards securing that the health and strength of workers, men and women, and the tender age of children are not abused and that citizens are not forced by economic necessity to enter avocations unsuited to their age or strength. The State shall, within the limits of its economic capacity

and development, make effective provision for old age, sickness and disablement The State shall make provision for securing just and humane conditions of work and for maternity relief. The State shall regard the raising of the level of nutrition and the standard of living of its people and the improvement of public health as among its primary duties."

We have examined elsewhere the constitutional provisions in regard to "health". In brief it may be stated that the item "public health and sanitation, including water supply and prevention of communicable diseases" is primarily the concern of State Governments, while the Centre is charged with the functions of international quarantine, port health and legislation in regard to food adulteration, welfare of lepers, mental deficiency and prevention of inter-State spread of communicable diseases.

Incidentally it may be mentioned that the basic principles under the W.H.O. Constitution, referred to in an earlier chapter, also envisage the same objectives as in the Indian Constitution, viz., that

"Health is a state of complete physical, mental and social well-being and not merely absence of disease or infirmity". "The achievement of any State in the promotion and protection of health is of value to all", and

"Unequal development in different countries in the promotion of health and control of disease, especially communicable disease, is a common danger."

3. Bhore Committee recommendations in regard to Public Health — General

The Bhore Committee stated that suitable housing, sanitary surroundings, a safe drinking water supply, adequate health protection to all covering both curative and preventive aspects, particular care of mothers and children, improving the nutritional standards qualitatively and quantitatively, elimination of unemployment, provision of a living wage for all workers, and improvement in agricultural and industrial production and in means of communication, particularly in rural areas, call for urgent attention. Recreation must receive serious consideration. No lasting improvement of the public health can be achieved without arousing the living interest and enlisting the practical co-operation of the people themselves.

The detailed recommendations of the Bhore Committee in respect of various aspects of public health will be referred to in later sections of this Chapter.

4. Modern trends in the public health field

The concept of "health" may be said to have undergone a radical change since the inception of the World Health Organisation with the basic principles referred to in this Report.

The practical shape which this new concept has been given so far in the health policies of some countries is briefly indicated below :—

(i) **United Kingdom:** A new development in the United Kingdom after the Second World War was the setting up of the National Health Service, which was designed to 'secure improvement in the physical and mental health of the people and the prevention, diagnosis and treatment of illness.' The services are available to every individual without any limitations of means, age, sex, area of residence, etc. No fees are charged except in respect of prescriptions, renewals or repairs of appliances and certain other additional amenities. The services are rendered through (i) hospital and specialist services, (ii) general practitioners service and (iii) health centres. Hospital accommodation, medical and nursing service, care of specialists (which is also provided at residences in special cases), ophthalmic services, etc. are freely given. The hospitals required for health services, both private and public, excluding teaching hospitals, are under the United Kingdom Health Ministry working through Regional Hospital Boards. Under the general practitioner service, thousands of private practitioners serve as 'family doctors' to groups of people in their respective areas, according to the choice of the people themselves. The health centres maintained by local authorities provide specified forms of service viz., maternity and child welfare, school health, home visiting and home nursing, vaccination, ambulance, care and aftercare of sick and mentally defective persons and even domestic help. The Health Ministry also deal with vital statistics, epidemiology, laboratory services, nutrition and research. Recently the Health Ministry has taken up hospital insurance plans, hospital pharmacy, dental health service, and medical re-habilitation. A note on the National Health Services in the U. K. may be found in Appendix B-13.

(ii) **Canada:** In Canada, the Federal Health Ministry works through the Dominion Council of Health and controls local health services, food and drug control, health insurance, industrial health and international health. With the increase of hospital insurance plans and health grants the State is imperceptibly taking over the health care of the entire population of Canada. The health departments are the co-ordinating authorities for hospital services, both voluntary and public. Health centres operating in several States look after the public health

side only. Great emphasis is placed on health education. Public Health nurses do commendable work in the sparsely distributed areas of Canada.

(iii) U.S.A.: The Federal Health authority co-ordinates the activities of State Health Departments and also deals with international quarantine. The co-ordination is done in the U.S. Public Health Service, Bureau of Food and Drug Administration, Bureau of Employees Compensation, Office of the Vocational Rehabilitation, Social Security Administration, Labour Department, Agriculture Department, Department of Interior etc. The U.S. Public Health Service undertakes and promotes research as one of its principal activities. Social Security Insurance and voluntary health insurance is expanding. Almost all hospitals are privately owned, except those dealing with tuberculosis and mental health. The private medical practitioners fully partake in the activities of the Federal and State Health authorities.

(iv) Japan: In Japan the National Health Administration has effective control over the health activities of local authorities. Communicable diseases and nutritional disorders are effectively controlled. Hospital care is provided under health insurance schemes. Emphasis is laid on health education. Insect and rodent control, disposal of night soil, sewage etc. are well cared for. Family planning and population control form part of the national policy of Japan and the birth rate has been considerably reduced. The law of abortion which was introduced after the war is being amended for the better care of the mother's health.

(v) Russia: Comprehensive medical care by integrating curative and preventive services at all levels is the special feature of public health work in Russia. The Central Ministry of Health directs, supervises and plans the health services in cities, oblasts and krais. There is an academic and scientific group for co-ordination of research and there is also an educational group for controlling medical education. The health departments are divided into three parts, medical, mother and child health and sanitary and epidemiological health services. All administrative work is performed by clinicians and specialists on a part-time basis. Comprehensive medical care in the U.S.S.R. includes services in hospitals, polyclinics, rest homes, sanatoria and treatment by balneological methods at health resorts. Vaccination against smallpox and immunization with B.C.G. are compulsory and immunization against diphtheria and pertussis is carried out as a routine measure. All epidemiological and sanitary services are controlled and directed by the Chief State Sanitary Inspector, who is also a Deputy Minister of Health in the U.S.S.R. Each Republic has a sanitary inspectorate. There is a

Birth-rate etc.

	1950-61
Birth rate	.. 40.7
Death rate	.. 21.6
Growth rate (1951-61)	.. 21.5
Infant mortality rate	.. 135
Life expectation	.. 41.9

It may be pointed out that half the total number of deaths occur in the groups 1-14 and of these again 50% of the deaths are under the age of 1.

Towns and Villages: The distribution of population in towns may be indicated roughly as below :—

Population	No. of Towns*
Over 1 lakh	.. 73
50,000 to 1 lakh	.. 110
20,000 to 50,000	.. 375
10,000 to 20,000	.. 665
5,000 to 10,000	.. 1,183
Less than 5,000	.. 661
	<hr/> 3,067 <hr/>

* Under "towns" we have included those places which have municipalities notified area committees etc.

The distribution of the rural population is as under :—

Population	No. of Villages
Over 10,000	.. 217
5,000 to 10,000	.. 1,916
2,000 to 5,000	.. 19,882
1,000 to 2,000	.. 51,740
500 to 1,000	.. 1,04,242
Less than 500	.. 3,79,992
	<hr/> 5,57,989 <hr/>

It will be clear how difficult it is to provide comprehensive health services in rural areas when there are 3,79,992 tiny hamlets in the country. We will be considering in another place the question of setting up Primary Health Centres in the 5,000 blocks into which rural India has been divided for administrative convenience as also for practical purposes in the matter of providing amenities of all types.

It may also be pointed out that the rate of urbanisation has been increasing during the last two decades, thus complicating the problem of providing adequate medical relief and other preventive measures against spread of diseases.

National Income: The National income during 1957-58 was estimated at Rs. 11,350 crores, 60.1% of the population being non-earning. The main earning class was "agriculturists". While workers in the mining and manufacturing sections, constituting 10.6% of the total number of workers, come under the Employees Insurance Schemes, the bulk of the earning class, viz. the agriculturists, are still to be reached in the matter of health facilities.

RECOMMENDATIONS

7. Morbidity pattern in India

- (a) Malaria has been endemic all over the country, although this disease has now been brought under control and is in the process of being eradicated.
- (b) Filariasis is a menace in coastal States and certain other interior areas.
- (c) Intestinal infections like typhoid, dysentery and diarrhoea are widespread. Cholera is endemic in some areas and flares up into epidemics every now and then.
- (d) Smallpox continues to be a problem of some size.
- (e) Nutritional disorders, arising out of the low calorific content of food consumed by the majority of people, deficiency of proteins and vitamins, iodine deficiency, etc. are common.
- (f) Diseases like diphtheria, whooping cough, pneumonia, meningitis take a heavy toll.
- (g) Tuberculosis incidence varies between 1 and 3%.
- (h) Venereal diseases are largely prevalent.
- (i) Skin diseases and leprosy form the next group.

- (j) Diseases of the eye and blindness caused by trachoma, small-pox and some of the venereal diseases are common.
- (k) Rabies is endemic throughout India.

The system of recording and reporting is such that estimates of the incidence of most diseases must be considered at best as intelligent guesses. It is only recently that some surveys have been undertaken. Sample surveys in respect of tuberculosis in different parts of the country have helped to give a clearer picture of the incidence of this disease. Surveys in Leprosy and Venereal diseases in areas of high incidence have also given some indication of the extent of these problems. Morbidity surveys have been carried out in some community project areas in the States of West Bengal, Assam and Orissa to gather some baseline data regarding morbidity patterns in rural areas. A summary of this survey as also one of the morbidity study under the contributory health services scheme in Delhi will be found in the Appendix...B-4.

8. Water Supply and Sanitation

(i) **Bhore Committee's Recommendations :** In suggesting a programme for water supplies in India, the Health Survey and Development Committee proposed a target of supply to 50% of the population with safe water supplies in 20 years and to the remaining 50% in the next 15 years. They recommended that the expenditure should be divided about equally between urban and rural supplies, that the work should be commenced only after due investigation of location of suitable and adequate sources, that the first five years should be spent in organising the investigative and executive machinery and that a water and drainage board should be established in each province and at the Centre consisting mostly of scientists and administrators to establish priorities in standards, promote research, ensure allocation of funds and facilitate the continued implementation of a steady policy by Government in the provision of water supply and drainage till the goal is obtained. The Committee's plans for water supply were integrated also with the plans of other health services in that they planned to provide and maintain 100% water supplies in the primary and secondary health units which were to be established through a Public Health Engineering Organisation integrated with the rest of the Health Department. They also planned to evolve more or less uniform standards and to ensure progress in implementation of their plans for water supply through a system of Grants-in-aid from the Central Government. The expenditure recommended was at least Rs. 14 crores per annum for 20 years for undivided India.

The Committee was also of the view that the P.W.D. will be concerned with the construction and maintenance of water works and drainage and the Public Health Engineering Section of the Health Department will be responsible for the supervision necessary to ensure compliance with prescribed standards. Where Provincial Governments maintain a special Department for dealing with drainage and water works, the Committee did not desire to suggest any change in these arrangements. They had also made general recommendations regarding provision of laboratory facilities for plant control.

(ii) **Environmental Hygiene Committee's Recommendations:** In June, 1948, the Environmental Hygiene Committee was constituted by the Government of India, Ministry of Health, to consider the steps to be taken to implement the recommendations of the Health Survey and Development Committee in regard to Environmental Hygiene. The terms of reference of the Committee were (1) Investigation of the whole field of environmental hygiene with special reference to (a) town and village planning, (b) general sanitation including conservancy and drainage, (c) housing — urban and rural, (d) water supply, (e) prevention of river and beach pollution (f) control of insect vectors of diseases and (g) regulation of certain trades, industries and occupations dangerous to health and offensive to the community; (2) Framing of the programme of development for the consideration of Government based on an examination of the recommendations of the Health Survey and Development Committee regarding environmental hygiene and of the Plans of the Provinces.

The Environmental Hygiene Committee's recommendations included:

- (1) Installation of new water supplies and improvement of existing water supplies in the towns of over 50,000 population,
- (2) Installation of protected water supplies in all permanent projects for the accommodation of displaced persons,
- (3) Provision of protected water supplies in all permanent pilgrim centres in India,
- (4) Provision of protected water supplies to at least 25% of the people in districts where cholera death rates are 100 or over per 100,000 per annum during last 10 years,
- (5) Provision of protected water supplies in areas of greater water scarcity, and
- (6) Development and maintenance of water supplies in areas covered by health centres where intensive personal and impersonal health services are being developed.

The Environmental Hygiene Committee also recommended the establishment of plant control laboratories and training of plant operators. It recommended the organisation of Public Health Engineering services on a strong and sound basis in the Health Ministry with the responsibility of design, construction and maintenance of Public Health Engineering works. It did not agree with the view expressed by the Bhore Committee that the Public Works Department should be in charge of the construction and maintenance of water works and drainage. The Committee suggested a plan for gradual extension of protected water supply to 90% of the population in 40 years. It also made recommendations regarding the production of Cast iron Pipes and other materials required for the water supply schemes. In regard to the question of financing of these schemes the Committee felt that the capital cost of Municipal Water Supplies should in principle be borne at least partly by the Municipalities and that the cost of maintenance should be borne entirely by them. It further recommended that the capital cost should be advanced as loan by the Government and recovered over a long term of years. Regarding rural water supplies the Committee suggested that the capital cost should be met entirely by the State Governments and that the cost and organisation for the maintenance of these supplies should also be provided by them through their Public Health Engineering Departments. In regard to organisation and administration the Committee recommended that it is essential both at the Centre and in the States to have a strong technical organisation which will be constantly at work to make use of every opportunity to improve environmental hygiene and whose special responsibility will be to ensure that the recommendations made in this behalf are carried out. It further recommended that the Public Health Engineering Department should be attached to the Ministry of Health and at the Centre there should be a consulting Public Health Engineer attached to the Ministry as Adviser. For the States there should be a Chief Public Health Engineer with headquarters staff for design, investigation, research etc., and with executive field staff for construction and inspections. It also suggested that the services of Municipal Engineers and operators of water and sewage works should be provincialised.

(iii) Action Taken : The National Water Supply and Sanitation Programme was inaugurated by the Government of India, Ministry of Health in 1954, with a view to providing water supply and sanitation facilities to all urban and rural communities over a planned period of development. Under this Programme long-term loans are sanctioned by the Government of India for urban schemes, whereas for the rural water supply and sanitation schemes a 50% grant-in-aid is sanctioned. The priorities recommended by the Bhore Committee and the Environmental

Hygiene Committee have been followed in the selection of the Schemes under this Programme.

A Central Public Health Engineering Organisation was set up in the Directorate General of Health Services, Ministry of Health in 1955 to implement the National Water Supply and Sanitation Programme and to advise the Government of India on problems connected with environmental sanitation.

In the States, the Public Health Engineering Department works under different Ministries in different States i.e. Health, Public Works Department, Local Self-Government.

Self-contained Public Health Engineering organisations exist in Assam, West Bengal, Bihar, Uttar Pradesh, Punjab, Madhya Pradesh, and Kerala.

In Rajasthan all Public Health Engineering Works are under the control of a Superintending Engineer and for all technical purposes it can be considered as an independent department. In Bombay, Mysore, Andhra Pradesh, Jammu and Kashmir, and Madras, Public Health Engineering Works are undertaken by a separate branch of the Public Works Department.

(a) **Urban Water Supply and Sewerage Schemes :** Under the First Plan a sum of Rs. 12.72 crores was provided by the Centre for urban water supply and sewerage schemes. One hundred and ninety three water supply and 57 drainage schemes estimated to cost Rs. 44 crores were actually technically approved. The States were able to spend about Rs. 8.30 crores out of the funds allotted by the Centre. Their actual expenditure was of the order of Rs. 10 crores including funds from State resources.

In the Second Plan the provision was Rs. 63 crores. During the Second Five Year Plan 51 Urban Water Supply Schemes and 8 Sewerage Schemes were brought under the scope of National Water Supply and Sanitation Programme. Thus, 244 Urban Water Supply Schemes and 65 Urban Sewerage Schemes estimated to cost about Rs. 68 crores have so far been included under the National Water Supply and Sanitation Programme for urban areas.

The following is the State-wise distribution of the Urban Water Supply and Sewerage Schemes sanctioned under this Programme :

S. No.	States	No. of New Schemes taken up during 2nd Five Year Plan		Spill over Schemes from the 1st Five Year Plan	
		Water Supply	Sewerage	Water Supply	Drainage
1	2	3	4	5	6
1.	Andhra ..	2	1	18	3
2.	Assam ..	2	..	..	..
3.	Bihar ..	1	1	9	..
4.	Bombay ..	1	..	35	8
5.	Jammu & Kashmir	1	1	..	..
6.	Kerala ..	1	1	4	1
7.	Madhya Pradesh ..	15	..	14	3
8.	Madras ..	3	1	14	3
9.	Mysore ..	1	1	18	6
10.	Orissa ..	4	..	..	..
11.	Punjab ..	4	..	35	23
12.	Rajasthan ..	..	..	14	..
13.	Uttar Pradesh ..	..	..	20	10
14.	West Bengal ..	9	1	10	..
15.	Delhi ..	1	1	2	1
16.	Himachal Pradesh	6	..	..	..
Total ..		51	8	193	58

(b) Rural Water Supply Schemes: In regard to rural water supplies it may be recalled that the Bhore Committee had recommended that the water supplies to be provided in rural areas may be of two types. In the smaller villages with population under 1,000 they recommended sanitary wells with hand-pumps and in villages with population of 1,000 and over they suggested a piped water supply system. The Environmental Hygiene Committee recommended that for villages with population of less than 5,000 sanitary wells with handpumps may be provided.

Under the National Water Supply and Sanitation Programme only villages with less than 5,000 population are considered and the scope of the programme was also restricted to piped water supplies for groups of villages from a common source. In certain cases, however, water

supplies for individual villages from well sources have also been approved under this Programme.

During the First Five Year Plan, the States spent a total sum of Rs. 2.8 crores as against the allotment of Rs. 6 crores for this Programme. In the Second Plan the total provision for the rural phase of the programme was Rs. 28 crores of which the Centre was to give a 50% grant.

During the First Five Year Plan 134 Rural Water Supply Schemes were approved under the Programme. During the Second Five Year Plan 94 Rural Water Supply Schemes were approved. This brings the total number of approved schemes to 228 and they are estimated to cost Rs. 17.7 crores. The State-wise distribution of Rural Water Supply Schemes is as follows :

S. No.	States	Name of Schemes		No. of Villages covered
		Spill over Schemes from the 1st Five Year Plan	New Schemes approved in 2nd Five Year Plan	
2		3	4	5
1.	Andhra ..	6	2	780
2.	Assam ..	7	7	1,941
3.	Bihar ..	8	1	578
4.	Bombay ..	10	49	850
5.	Jammu & Kashmir ..	1	1	1 *
6.	Madhya Pradesh ..	4	3	671
7.	Madras ..	8	..	502
8.	Mysore ..	4	7	172
9.	Orissa ..	13	1	1,141
10.	Punjab ..	14	3	114
11.	Rajasthan ..	2	3	..
12.	Uttar Pradesh ..	3	8	1,489
13.	West Bengal ..	10	1	1,357
14.	Kerala ..	4	7	31
15.	Delhi ..	2	..	256
16.	Himachal Pradesh ..	38	1	170
Total ..		134	94	10,053

* Only new schemes.

Most of the States are still not completely equipped with men and materials for carrying out the rural water supply and sanitation programme and the bulk of expenditure shown in many cases constitutes perhaps, the value of the materials and equipment supplied to them by the Centre or procured by the States independently. The organisational set up for handling the rural phase of the National Water Supply and Sanitation programme has not been given the importance it deserves. There is still a feeling that rural water supply and sanitation works do not involve any Public Health Engineering knowledge or competence and that any available agency technical or even non-technical could be pressed into service to execute such works. The multiplicity of the agencies entrusted with this part of the programme accounts for the halting progress and doubtful results achieved so far. A re-orientation of the existing policy and procedure is necessary in order to achieve better results in the future. These problems were considered in detail by the Conference of Public Health Engineers and they recommended that all Public Health Engineering Works whether in the Development Blocks or under any other organisation should be controlled and executed to the extent possible by the Public Health Engineering Department and the entire phasing, design and construction methods should be left to them instead of being under the control of non-technical departments. Where such transfer of control of Public Health Works is not immediately possible, the Public Health Engineering Department should at least be fully utilised by different agencies in planning technical advice and approval of the schemes and estimates. All such works should be under the unitary control of the State Public Health Engineering Organisation.

According to the estimates of the Environmental Hygiene Committee roughly 6.15% of the total population had protected water supply while 3% enjoyed the amenity of a sewerage system.

The expenditure during the First and Second Plan periods so far has been mostly on the urban water supply schemes and that too on improvements to existing schemes. Sewerage schemes were but few. It is therefore, difficult to hazard an estimate about the additional urban population which has been provided with protected water supply during the First and Second Plan periods. Assuming, however, that the total expenditure during the period is equally divided between new schemes and improvements to old schemes, it may be estimated that the population so benefited would be about 1.3 crores during the period, based on an average per capita cost of Rs. 40. As against such additional population coming in for the amenity during the period, the increase in the country's population during the same period would probably more than off-set the figure. It may, therefore, be pertinent to assume that there

has been little or no improvement in the situation over the percentage figures previously reported by the Environmental Hygiene Committee.

Under the rural phase of the National Water Supply and Sanitation Programme 228 schemes, covering some 14,000 villages may be expected to have covered about 0.5 crore population.

The maintenance of many of the completed schemes is reported to be going by default. Having got the scheme as a gift from Government a villager has no incentive to maintain it in efficient working conditions. On the other hand he expects the State Government to look after the maintenance also for an indefinite period of time. A pattern of organisation and procedure which would ensure financial participation by the villagers in the maintenance aspects of the programme is yet to be evolved.

It has also been the experience that the engineering organisations in the States do not at present have any category of personnel who reach down to the level of the village and who can be said to be in touch with the local conditions, needs and aspirations, the resources locally available and the available agencies who can profitably be employed in the furtherance of the rural water supply and sanitation programme. The health inspector or the sanitary inspector of the Public Health Department is not a suitable type of person to be entrusted with the implementation of the rural water supply and sanitation works. He does not have the basic qualifications in Public Health Engineering and he is pre-occupied with his own duties in regard to public health preventive aspects, vital statistics, vaccination and the like. Recognising this the Third Conference of Public Health Engineers recommended that the Public Health Engineering units should have sanitary inspectors attached to them specially trained in health education and environmental sanitation for assisting the Public Health Engineers in the furtherance of the rural water supply and sanitation programme.

The structure of the organisation from the village level upto the State Public Health Engineering authority, and the details of the organisational set up suitable for dealing with the urban and rural water supply and sanitation phase of the programme under one co-ordinated responsible agency, viz. the Public Health Engineer of the State are yet to be evolved.

Unfortunately correct and authoritative statistical data are lacking in regard to the existing water supply and sanitation facilities in urban and rural areas in the country. According to the 1961 census 8 crores of people live in urban areas while some 35 crores live in the rural areas of the country. From the rough

data available, it may be assumed that about 75% of the urban areas lack protected water supply while over 85% lack the amenity of a sewerage system. It is also a fact that even in those urban areas where water supply or sewerage facilities do exist these facilities are inadequate to meet the requirements of the population and are in need of substantial additions and improvements. According to the 1961 census the number of cities with a population of 100,000 and over is 111, between 100,000 and 50,000 it is 100, between 50,000 and 20,000 it is 311 and between 20,000 and 10,000 it is 1,442. Against this, the number of municipalities with adequate protected water supply is 221, the number of municipalities with inadequate protected water supply is 466 and the number of municipalities with no protected water supply is 1,471. Thus, just about one-tenth of the municipalities have adequately protected water supplies, about one-fourth inadequate supplies and about two-thirds have no protected water supply at all. The sources of water supply in rural areas are wells or tanks. Under the National Water Supply and Sanitation Programme groups of villages have generally been provided with piped water supply wherever possible. The total number of villages covered so far under this scheme is about 14,000. In addition to this water supply for the villages mostly through the sanitation of existing wells, sinking of new wells, installation of tube-wells and tanks has been carried out under the Community Development programme, the local development programme and schemes for the upliftment of Scheduled Castes and Backward Tribes, etc. Assuming the average cost of an urban scheme at about Rs. 50 for water supply and Rs. 75 for sewerage per capita, the financial outlay necessary to complete water supply and drainage schemes for all urban population who lack these facilities would be of the order of Rs. 825 crores. If additions and improvements to existing facilities in urban areas are also to be taken into account, the total figure may be of the order of Rs. 900 crores.

Of some 5½ lakh villages only some 14,000 figure in the National Water Supply and Sanitation Programme so far. 'On a broad approximation, it may be taken that the total cost of providing water supply and sanitation facilities all over the countryside to cover the entire rural area and to bring about a satisfactory standard of environmental sanitation may be of the order of Rs. 600 crores. The programme to be evolved should be such that at some stage in its implementation the responsibility of continuing it should gradually fall on the shoulders of the villagers so that Government is not tied up with the programme for ever.

With such a work load ahead it will be clear that at an expenditure rate of Rs. 50 to Rs. 60 crores for one five year plan, it would take us more than half a century before the urban population would have been catered for. If the increase in population during this half a cen-

tury is also taken into account, as it should be, it would increase the period further by a few more decades. As for the rural phase it may well be a century if not longer before the entire country could be covered at the pace at which works are proceeding at present. The magnitude of the urban and rural water supply and sanitation problem which awaits accomplishment may involve a total outlay of the order of Rs. 1,500 crores. The aim should be to accomplish this entire workload within the space of about 25 years if the country is to register any tangible improvements and derive benefits flowing out of a successful environmental sanitation programme.

(c) General sanitation including conservancy and drainage :

The Bhore Committee had stated that sewage works and drains have to be planned and built to keep pace with the extension of piped water supplies particularly in larger urban centres. As a short term objective they had suggested the carrying out of sewerage and sewage disposal works in all health resorts and industrial colonies housing thousands of people or more as well as the remodelling of existing sewerage system on lines sufficient to provide for the connection of at least 95% of houses in the area concerned. The Environmental Hygiene Committee had also suggested a short term plan for sewerage and sewage disposal to be achieved in five to ten years. They had suggested improvements to existing installations, extensions of sewerage to newly developed areas, laying of sewers in all unsewered cities and in predominantly industrial towns and more complete utilisation of sewers in sewerred areas. The Committee had also advised against the construction of sullage drains indiscriminately. It has, however, been observed in practice that the local bodies are reluctant to sponsor sewerage schemes, as most of them could hardly afford to finance their sewerage schemes in addition to their water supply systems. From time to time the idea of providing a surface open drain system to deal with the stagnant sullage as a cheaper solution than the provision of sewerage system has been given effect to. The results have not always been commensurate with the capital investment involved in such part utility schemes. It was at best but a partial solution to the problems but it also gave a false sense of security. So far only some sewerage schemes have been brought under the scope of the National Water Supply and Sanitation Programme as against 244 water supply schemes. Under the present concept of return on the cost of project the local bodies have found that the sewerage schemes are least remunerative in terms of visible money values and this explains the reason why they are unable to promote such schemes with the same facility as they do water supply schemes under present conditions of financing. It also explains why urban sewerage schemes make no headway even where the need was

keenly felt. But the installation of a water supply scheme in any urban area makes a sewerage scheme for that area unavoidable. Naturally, therefore, the problem of urban sanitation will have to be faced and sewerage systems provided as an inescapable civic amenity sooner than later. For the local bodies to do so it is necessary to review the question of financing the water supply and sewerage schemes on a more realistic basis and as mutually dependent and inseparable amenities in any urban unit. The Conference of Public Health Engineers recommended that the local bodies should promote their urban water supply and sewerage schemes as joint ventures and take into account the invisible returns and benefits accruing from sewerage schemes while assessing their financial implications.

On the question of river pollution control the Bhore Committee and the Environmental Hygiene Committee had stated that sewage treatment and waste treatment should be carried out to the extent necessary to adjust the pollutorial load to the capacity of the receiving body of water for self-purification. They further observed that though 'we are not yet ripe for laying down standards for legislative enactment, we can control pollution by investigation in each case.' They had also said that if Water and Drainage Boards as envisaged by the Bhore Committee were established, they can study the pollutorial status of our rivers and carry out necessary research. Although the contemplated Water and Drainage Boards have not been established, field research activities under several agencies are going on in this country.

Regarding rural sanitation, the Environmental Hygiene Committee had stated that the aim should be to promote latrines in each house, and not public latrines and that the expenditure on public latrines should be limited to the barest requirement in the rural sanitation programme. They had also emphasised the need for health education in this respect. Under the National Water Supply and Sewerage Programme the construction of sanitary latrines in each house is encouraged. Considerable work has been done in recent years in the research-cum-action centres at Najafgarh, Singur and Poonamallee regarding the type of latrine that is most suitable for rural areas. Under the auspices of the World Health Organisation, two pilot projects had been established one at Trivandrum and the other at Lucknow, especially to study the Environmental Sanitation problems in rural areas and to suggest suitable solutions.

(d) Collection and disposal of refuse :

On the question of refuse collection and disposal, composting and other aspects of general sanitation, the Bhore Committee and the Environmental Hygiene Committee made some general observations and

recommendations. Under the National Water Supply and Sanitation Programme during the First and Second Plan periods emphasis has been laid only on the provisions of water supply and sewerage and sewage disposal arrangements in urban areas and provision of water supply and sanitary latrines in rural areas.

(e) Training of Personnel :

The need for having qualified Public Health Engineers for tackling the problems of environmental hygiene was stressed by the Bhore Committee. They had recommended that a beginning be made at the All India Institute of Hygiene and Public Health, Calcutta. Accordingly, a post-graduate course leading to the degree of Master of Engineering in Public Health was established at the All India Institute of Hygiene and Public Health, Calcutta in 1948-49. A more elementary 3-month course for Public Health Engineering subordinates is also given at the Institute once a year. As suggested by the Bhore Committee opportunities are given to Public Health Engineers in Government service to visit foreign countries for the study of recent advances in this subject. The Environmental Hygiene Committee had also emphasised the importance of organising training courses for Public Health Engineers and the utilisation of trained personnel. They had further stated that the Central Government should assume responsibility for training personnel required for improving environmental hygiene and that the training of high grade personnel should be the responsibility of the Central Government for at least ten years to ensure uniformity of standards. Among the categories of personnel listed by them were Public Health Engineers, Public Health Engineering subordinates, town planners, plant operators, medical officers of health, sanitary assistants, specialists in Public Health, chemistry, biology, etc. and industrial hygiene. The Health Ministry has sanctioned a comprehensive programme for the training of engineers and auxiliary personnel in Public Health Engineering required for the implementation of the National Water Supply and Sanitation programme. A provision of Rs. 30 lakhs was made for the training of Public Health Engineers, Engineering subordinates, water works plant operators and sanitary assistants at different institutions with suitable programmes drawn up for the purpose. To give a fillip to the programmes the Ministry of Health have also given stipends and other concessions to the participating trainees. At present the candidates are sponsored under this programme for the post-graduate course in Public Health Engineering at the All India Institute of Hygiene and Public Health, Calcutta, and the Engineering College, Guindy, Madras. Post-graduate courses are also given at the Roorkee Engineering College and by the Faculty of Technology, Baroda University. Intensive courses of short duration have also been organised at the Roorkee

Engineering College, at the Engineering College, Guindy, Madras and at the All India Institute of Hygiene and Public Health, Calcutta. Courses for the plant operators and sanitary assistants are organised at regional centres. The following numbers in each category are understood to have been trained during the Second Plan period.

				No. of Trainees
Engineers P. G. Course	..	..	..	110
Engineering Subordinates	..	..	..	168
Short Term Course	..	..	..	662
Water Works Operators	..	..	..	76
Sanitary Inspectors	..	..	..	27

A programme for the training of 300 Engineers, 900 Engineering Subordinates, 300 Water Works Operators and 250 Sanitary Inspectors is contemplated in the Third Plan.

(f) Research :

The Bhore Committee as well as the Environmental Hygiene Committee stressed the importance of research in this field. During the Second Plan period a Central Public Health Engineering Research Institute has been established at Nagpur under the auspices of the Council of Scientific and Industrial Research to carry out research in Public Health Engineering subjects and also to co-ordinate all such research activities in this country. In addition, the Indian Council of Medical Research has also a section working on environmental sanitation problems. Several of the teaching institutions are also establishing research wings. International agencies like the World Health Organisation, T.C.M., Ford Foundation, the Rockefeller Foundation and some of the private agencies are also assisting research in this field, especially on the rural aspects of the problems.

A committee to evolve standards and specifications for urban and rural water supply schemes and to prepare a code of practice for public health engineers is understood to have been set up by the Government of India. Another Committee has collected detailed information with regard to the actual position of water supply and sanitation facilities in urban, semi-urban and rural areas of the country. The data collected by this Committee should be helpful in making a precise assessment of the actual condition obtaining at present, on the basis of which long term plans for future development could be drawn up in a more realistic manner than has been the case so far.

(iv) Recommendations :

(a) Water Supply : Apart from the question of availability of financial resources for undertaking the gigantic schemes of providing adequate water supply facilities to the population of the country, the factors which have played a part in determining the speed of the execution of the water supply and sanitation programmes are those of lack of sufficient suitably trained public health engineering staff, public health engineering being a subordinate wing of the Public Works Department, difficulties and delays in the procurement and distribution of plant and material required for the schemes and the procedural and administrative formalities which have now to be gone through before the schemes are ready for execution. A much needed change in outlook in the management of water supply projects is called for. We have made our proposals in another context regarding the place of the Public Health Engineering Department in the administrative set up of the Health Services. The practice by far and large has been for the Corporations and the local authorities to undertake projects directed towards meeting their own individual needs. There is not much evidence of local authorities getting together to develop joint projects which would enable them to tap sources, not otherwise within their reach. While electrical grids and irrigation facilities have been developed which serve large areas and which are financed and maintained by organisations common to more than one Government, no serious efforts have been made to develop water supply schemes on the same lines. The recommendation of the Public Health Engineers Conference for the formation of Water and Sewage Board to serve a number of municipalities and other local authorities in an area has therefore much to commend it. Such Boards, if formed, are likely to be in a position to raise resources for water supply and drainage schemes which the individual local authorities may not be able to allocate for this purpose. Such boards may be able to finance the schemes by floating loans and repaying them out of the earnings from the sale of water to the local authorities in their areas. Another direction in which re-orientation is necessary is that of legislation directed towards conserving sources of water and towards regulation of the exploitation of ground water. We would like to draw attention in this connection to the Water Act 1945 of U.K. which entrusts the Minister of Housing and Local Government with promoting the services and proper use of water resources for the provision of water supplies in England and Wales and with securing the effective execution by water undertakers of a national policy relating to water. The Act gives the Minister the necessary powers to require the local authorities to take certain action and to set up the necessary machinery to secure the objectives of the Act. The relevant provisions of this Act are extracted briefly in Appendix B-15.

In order to overcome the commonly experienced difficulty of finding adequate sources of water close at hand, we suggest that the possibility of tapping perennial rivers throwing out large quantities of unutilised water into the sea should be explored, before their entry into the sea. This should, in our view, be possible without affecting the riparian rights of any other State. Such water may be collected in reservoirs and carried through conduits to every village through storage tanks. In areas where there are a large number of rain-fed tanks, they may be inter-linked with one another wherever possible. Another possibility of providing water in the coastal areas may be by desalination of sea water. We consider that schemes for the provision of water supply to every village with a population of 500 before the end of the Fourth Plan period should not be considered ambitious, particularly if it is remembered that the expenditure that may have to be incurred on such schemes will still be far less than the expenditure required for combating the water borne diseases.

There are two other aspects of this question which appear to us to deserve serious consideration. The progress made in the matter of improvement and expansion of water supply, particularly in the urban areas, although on a limited scale, has shown signs of deleterious effect on the drainage situation in those areas. Partly on account of the inadequacy of funds available for this purpose and partly on account of lack of full appreciation of the effects of improvement of water supply position without corresponding facilities for drainage, there has been a neglect of the latter. There is evidence already of an increase in the mosquito population in such areas. One of the phenomena observed recently is the appearance of filariasis in cities where it had not existed before. It is of the utmost importance therefore that drainage and sewerage schemes run parallel to the water supply schemes in the urban areas. Another reason which has been represented to us as responsible for this state of affairs is the comparatively poor return from drainage and sewerage schemes which the Municipalities and the Corporations are therefore reluctant to finance from out of loans being advanced to them by the Government of India through the State Governments. To remedy this situation, we suggest two courses of action. Part of the moneys advanced by the Government to local authorities for water supply schemes may be treated as grants on the condition that the water supply scheme undertaken with the help of the loans from the Government are integrated with drainage and sewerage schemes to be undertaken at the same time. The second line of action is in the direction of research for the development of methods for the treatment of the effluents in a manner so as to bring in as high a return as possible with least investment. Expensive sewerage treatment plants etc. are likely to be beyond the reach of the large majority of the smaller

municipalities and the objective of the research should therefore be to evolve methods which can be practised without heavy outlay on plant and equipment.

(b) Drainage and disposal of human waste, factory waste, etc.:

The disposal of waste including human excreta is a very pressing problem and the methods at present employed in most parts of the country are not sanitary, nor are they consistent with human dignity. In large urban areas the solution lies in providing underground drainage to every town of a population of 30,000 or over. Underground drainage may not be possible in scattered areas or in villages. This requires expert study taking into consideration the nature of the soil, the local circumstances etc. Methods of disposal of human excreta most suited to an area will have to be evolved. As an immediate measure we suggest that in every State a pilot project should be set up to study the various methods of disposal of sewage and human excreta in a rural area. We consider such a study as not only important from the public health point of view but also as very urgent in view of the rapid development of ideas in regard to human dignity. It is expected that within the course of next 10 to 15 years such ideas are bound to react on society and cause great handicaps in regard to the disposal of human excreta in particular. We strongly hold that suitable receptacles like handcars and other mechanical devices should be provided and dignified and hygienic methods of collection and transport of night soil should be brought into practice.

In this connection it is understood that the Government of Bombay appointed a Committee to go into the living conditions of scavengers in that State and that their recommendations were accepted by the Government of Bombay. It is also understood that extracts of these recommendations have been circulated by the Government of India in the Ministry of Health to various other State Governments for adoption.

The Committee also feel that not only health education but also punitive measures should be instituted in order to prevent contamination of open spaces used for defecation.

(c) Rural Latrine Programme: Research-cum-Action Projects were set up some years ago in collaboration with the Ford Foundation, with the object of making a thorough study of the existing attitudes towards the use of sanitary facilities in the villages, of finding the underlying causes for these attitudes and ways and methods of changing them, of evolving a pattern of sanitary latrine which could be cheaply constructed from materials locally available, and of suggesting the ways and means of popularising the use of such latrines in the villages. As a

result of the extensive work carried out by these projects at the Health Centres of Singur, Poonamalle and Najafgarh a pattern of sanitary latrine, which can be easily fabricated in the villages at a cost of not more than Rs. 10/- to Rs. 15/ (without the super-structure) has been evolved. Drawings and specifications of this latrine can be seen in Appendix C-12. It has been correctly emphasised in the report of the Research-cum-Action projects that for the Latrine programme to make a headway, the construction and design of the latrine should ensure that the faecal matter is easily flushed out with the use of the minimum quantity of water, that faecal odour is eliminated; that flies are kept under control, that the accumulated night soil can be used as manure and that the latrine can be constructed cheaply from material available locally. The report also emphasises correctly that to induce the average villager to give up his age old habits of using the fields in favour of latrines, which with the existing limitations of water supply in the village at large cannot be expected to be inviting places, intensive and sustained public health education programmes will need to be carried out in support of the Rural Sanitary Latrine Programme. In this programme conventional methods of group discussions, enlistment of the help and co-operation of the village leaders, local administration etc. may be helpful. A satisfactory solution of this problem in the villages will depend more upon an appeal to civic consciousness of the community rather than on the motivation of the individual villagers. In the latter approach it may not be easy to bring home to the villager, as far as his and his family's health is concerned, the relationship of cause and effect when he takes care to see that he deposits the faecal material in fields away from his habitation. It is the cumulative effect of this practice on the community as a whole that is more likely to lead to collective action on the part of the village community. This should provide a field of activity for the village Panchayat to take up this work as part of its essential functions in every village. The Community Development Block organisation will have to make it its responsibility to fabricate the latrine according to detailed instructions with regard to the actual construction of the latrine and to provide an agency for the periodical supervision and servicing of the latrine put up in its area. As an additional inducement competitions at the village development block and Zila Parishad levels may be usefully organised in the earlier parts of the programme where some token of recognition for creditable effort on the part of the individuals and communities should be awarded. Another matter of considerable importance in this connection is that of mobilising and co-ordinating the effort being presently made in this field through a number of agencies like the Community Development Block, the agency for assisting Backward Classes, the Local Development Works, the National Water Supply and Sanitation Programme, the Zila Parishads and Pancha-

at Unions, the State Health Departments etc. This has resulted in considerable dispersal and overlapping of effort in the past with the result that the return has not been consistent with the effort and investment made by the respective agencies. We are suggesting in another part of our report in the set up of the District Health Organisation the provision of a Public Health Engineer who should be responsible for co-ordinating and planning the Public Health Engineering activities in the district, irrespective of the source of the funds for the programme. This should provide the administrative co-ordination which is badly lacking in this programme at present and which hampers the progress for rural sanitation programme.

(d) **Fluorosis :** The occurrence of significant amounts of fluorides in water from wells in several parts in South India, and the prevalence of characteristic symptoms of chronic fluorine intoxication in human and cattle populations, was reported by Shortt, Pandit and Raghavachari some 25 years ago. The mottling of teeth in children, in varying degrees of severity, was noted in most of those areas where the fluorides content of waters was one part per million or more, and skeletal changes, due to the deposition of fluorides at different sites in the body, in limited geographical areas where the fluoride content was over 2.5 parts per million. Subsequent surveys conducted by workers in different parts of the country revealed the existence of fluorosis in several other regions and it is particularly severe in the States of Madras, Kerala, Andhra Pradesh and in the Punjab. It is likely that many areas in other States are also affected.

It is interesting to note, however, that in other parts of the world, skeletal changes due to ingestion of fluorides have not been reported, even though the fluoride content of waters was much higher than that noted in the areas investigated in India. There is reason to believe that the increased severity of symptoms is associated with low nutritional status. Field surveys, as well as animal feeding experiments, have shown that the condition was aggravated by a deficiency of ascorbic acid.

We have to point out that there is yet much to learn about the problem of fluorosis. It is necessary to conduct clinical, dental and radiological surveys to determine the extent of the problem, and to ascertain the limits of the permissible amount of fluoride in drinking water supplies. It must be remembered that, apart from its presence in drinking water-supplies, fluorine also occurs in varying amounts in many Indian foodstuffs. The total intake of fluorine that might lead to skeletal changes has also to be worked out. Detailed studies on fluorine metabolism are equally necessary to elucidate the mechanism underlying fluorine intoxication.

The problem of fluorine intoxication is thus of considerable public health importance. It must be noted that the condition is particularly prevalent in rural areas. Attempts to ameliorate the condition by the administration of dietary supplements have not been successful. The only alternative, therefore, is to provide fluoride-free water supply. The possibility of utilising surface waters, the fluorine content of which is usually low, is not found to be practicable in many areas because of the geological conditions involved. The only satisfactory approach to the problem, therefore, is to remove fluorine from water by suitable procedures. This approach is admittedly a difficult one. Numerous attempts have been made in different parts of the world to devise methods for the removal of fluorine from water, but none of them is likely to be suitable for adoption in India because of the costs involved. We understand that a method of fluoride removal with the use of alum impregnated paddy husk carbon has been developed by Venkataramanan and his colleagues in the Institute of Science, Bangalore, and in co-operation with the King Institute, Guindy, and that it is being utilised, on a pilot plant scale, in the treatment of water in one area. A critical appraisal of the results obtained on this project is obviously necessary. It is equally essential to develop other methods. We are glad to note that this aspect is being pursued by the Public Health Engineering Institute of the C.S.I.R.

9. Housing: including Industrial Housing, Urban and Rural Planning

(1) *Housing*: It is a well-known fact that the housing problem in India has assumed serious proportions in recent times. The tremendous increase in population as evidenced by the last 4 census reports, the disproportionate growth in urban population consequent upon rapid urbanisation and migration of the rural population to towns and cities in search of employment, the sudden influx of displaced persons after partition are some of the aggravating factors. The evils of overcrowding, the creation of slums in and around cities and industrial estates have in their turn created unprecedented difficulties to the public health authorities. Even at the time the Environmental Hygiene Committee reported in 1948, the shortage in urban areas was estimated at 28.4 lakhs of houses. Rural housing presents a sadder picture.

The Environmental Hygiene Committee observed that, 'Housing conditions in India have deteriorated very badly during the last eight years. In cities like Bombay, Delhi, Calcutta, Kanpur and Madras, it has become almost impossible even for the rich and the upper classes to secure accommodation at any price. Families accustomed to good living huddle together in single rooms under indescribable conditions of privation and pay inflated rents to retain them. Rent Acts and Controls have

done little good. Relationships between landlords and tenants have been soured and greed has debased human beings to the level of beasts in exploiting the shortage of housing accommodation for their profits. There are a few housing schemes going on in the country to-day. The Rehabilitation Ministry and Railways are building houses. Houses are under construction for the priority projects of Government The house building programme in the coal mines has slowed down.....All these are Government projects getting their allocation of building material under some priority though enjoying some preference over private enterprise for allocation of building materials. Building Co-operative Societies in various places have been able to build only slowly owing to the lack of materials and their costs having risen. The Environmental Hygiene Committee came to the conclusion that housing must be accepted as a public utility and State should intervene to the extent of preventing excessive exploitation of the public for private profit and ensuring that the service rendered is covered by adequate payment.

In the meantime the country was partitioned and strangely enough this one single factor pushed Government into the field of construction of houses for persons other than their own employees.

The Government of India in the Ministry of Works Housing and Supply are fully seized of the housing situation in the country. Housing Ministers' Conference have been meeting regularly since 1955. In this connection the inaugural speech of the Union Minister for Working Housing and Supply in 1955 is worth quoting. He said "We have ventured into this field and despite the short-comings in the data that is at hand, we find that during the 5 years from 1956 to 1961, 98 lacs of urban houses will have to be built if we are to cater fully for the normal increase in population ; to provide for the shift of population from the rural to urban areas ; to ease the existing congestion to provide shelter for those who live in the streets and replacement of the houses which have outlived their normal lives or are unfit for human habitation. The cost of constructing these 98 lacs of urban houses will run into huge figures ; but even if we work on the target of building 30 lacs of houses, which is mentioned quite often these days, the cost will come to Rs. 1,250 crores on a very conservative reckoning. I have deliberately not mentioned anything about rural housing so far for if urban housing alone is to cost us such a large percentage of what we intend spending on the Second Plan as a whole, a thorough-going housing scheme for the rural areas will take us well beyond the total provision of the plan. If we are modest in our approach and confine ourselves to only improving the existing 54½ lac units of rural dwellings, we find that even by spending one hundred rupees for every hut and Rs. 250 per house in the villages on building materials alone, the labour required being given free by the villagers,

the cost will come to Rs. 912 crores. Even so we will have only touched the mere fringe of the problem without very satisfactory results".

The chapter on Housing in the First Five Year Plan stated *inter alia* "In these times, the State cannot afford to confine its role in this field to planning and regulation, private enterprise is not in a position to do the job so far as low-income groups are concerned. They cannot afford to pay the economic rent for housing accommodation of even the minimum standards. The State has therefore to fill the gap and assist the construction of suitable houses for low and middle income groups both in urban and rural areas as a part of its own functions. This would involve a large measure of assistance which may take the form of subsidies on a generous scale and the supply of loans on a somewhat low rate of interest. In view of the gravity and vastness of the problem and the financial condition of the States, the Central Government have to accept a large measure of responsibility for financing housing programmes in the industrial centres where congestion and shortage have become very acute in recent years. Provision should also be made to find funds for middle class housing schemes, preferably through co-operative house building societies. We would, however, suggest that the State Governments, who are being relieved to a large extent of the responsibility for industrial housing, should concentrate on ameliorating conditions of housing in rural areas."

Thus the Industrial Housing Scheme of Government was formulated in 1952 and the Low-Income Group Housing Scheme in 1954. In addition the Plantation Labour Housing Scheme was introduced in 1956 under which loan assistance was given to planters through State governments. The other scheme which was initiated in 1956 relates to slum clearance, under which 25% of the approved cost of a slum project is given by the Government of India as outright subsidy and another 50% as a long-term loan.

During the First Plan, in addition to the houses constructed under the above mentioned schemes, substantial programmes were undertaken by the Ministries of Rehabilitation, Defence, Railways, Iron and Steel, Production and Communications. The State Governments and a number of local bodies also added to the housing programme of the country. It is estimated that a total of 1.3 million houses were built during the First Plan period.

The Second Five Year Plan envisaged an addition of 1.9 million units to urban housing under all heads.

The Minister for Works Housing and Supply in his address to the Housing Ministers' Conference in 1957 said *inter alia* "for the decade-

1951-61 when the rise in the urban population is estimated to be about 20.6 million, the number of houses required in urban areas after taking into account the shortfall of 2.5 million houses in 1951 ; the new requirements, the demolition of old houses and the replacement of the overaged is estimated to be about 8.9 million houses. During this decade we will, however, have got 3.2 million houses—1.3 million in the First and 1.9 million in the Second Plan. Thus the shortage in 1961 will be about 5.7 million or at least twice as much as it was in 1956."

(ii) **Urban and Rural Planning :** It is important that environment which largely influences human activities should be such that man's activities are carried on without affecting him physically and mentally. *Until the beginning of the industrial revolution in India, human environment was fairly simple and satisfactory in nature. But the growth of industries brought in its wake continuous heavy migration from rural to urban areas, uncontrolled vertical growth of the urban areas with the attendant evils through creation of slums, the pollution of air and water by smoke, dust, industrial waste, etc. Transportation to places of work also became difficult and tiresome thus affecting the physical standards of the labourer. Hygienic standards became so low that the danger of epidemics loomed large.*

The haphazard growth of urban areas without provision for rudimentary requirements of healthy living during the last two decades and more, the rapid process of urbanisation and the other attendant evils point to the necessity for careful town and regional planning, proper housing, provision of adequate protected water supply and drainage on a regional basis, adequate transport facilities etc. The town planning should also include improvement of existing houses, clearance of slum areas, location of industries, provision of schools, play grounds, parks etc. and provision of sufficient medical facilities.

We learn that the Ministry of Health have recently set up a Central Regional and Urban Planning Organisation which will act as a technical advisory organisation, lay down national policies for urban and regional planning, co-ordinate the activities of the Central and State agencies, advise State Governments and local bodies and also do research. It is hoped that the States will take full advantage of this Central Organisation.

(iii) **Recommendations :** In regard to housing, we specially recommend that early steps should be taken to see that as far as possible housing accommodation is made available to all employees of State and Central Government services, to all industrial workers employed in large factories, and to those who are associated with public utility concerns.

We believe that in planning for housing, it would be necessary to create what are known as satellite towns so that the pressure on existing accommodation is not increased.

Where industrial developments are made, it would be much better to see that the area is sufficiently large and well planned, not only for the industries concerned but also for meeting the requirements of industrial labour in regard to housing and other amenities.

While we do realise that in the case of large building colonies, it may be necessary to have multi-storied buildings, we feel that certain safeguards ought to be taken for provision of free perfilation of air in buildings, for transport facilities and for other ancillaries like schools, hospitals, playgrounds, shopping centres and parks.

The increasing spread of slums and pavement dwellers is a great danger to public health and from this point of view not only should slums be removed but alternative provision made so as to accommodate such of those slum dwellers who are wage earners in other convenient areas. This would also call for provision of better transportation facilities particularly in industrial areas which require a number of part-time service workers.

We note that a number of co-operative housing schemes have come into being and that the Life Insurance Corporation is having a plan for subsidising housing schemes. These will go a long way in providing not only more houses but also a safe method of investment.

The type of houses that ought to be built in urban and rural areas requires to be studied carefully. It is essential that houses should be constructed with all necessary sanitary provisions. Modern types of construction will be safe from many points of view, though they may not be considered completely satisfactory as the long-range policy. In many areas where equable temperature is prevalent all through the year, the type of houses to be constructed should be different from those in places where extremes of temperature are prevalent. We understand that these problems are being studied by the appropriate agencies and we hope that the recommendations of these agencies when implemented will go a long way in the speedy construction of houses so urgently required.

The starting of an industry should be the joint responsibility of the Commerce and Industry Ministry, the Health Ministry and other agencies. When a licence is given for the starting of an industry, it should be ensured that the health conditions afforded to the industrial workers should be in accordance with the provisions of the Factories

Act. It should also be ensured that all industrial waste is disposed of in such a way that it is not deleterious to the health of the industrial population. This responsibility should be squarely placed on the States concerned.

So far as housing for the other sectors of the population is concerned, we feel that there should be proper town and country planning before housing schemes are sanctioned. In most of the Western countries town planning has been in operation extensively particularly after the two World Wars and satellite towns have been developed in an orderly manner. We hold that uncontrolled expansion of cities is not conducive to the health of the population both of the cities and the surrounding areas. Particular attention has to be given to problems of water supply, drainage, etc. which are necessary for the sanitary living of the population concerned. This aspect is particularly important in respect of industrial developments, that are taking place in the country at present. House construction plans should be scrutinised with particular reference to accommodation, free circulation of air, sanitation, etc. For orderly construction of houses encouragement should be given to co-operative house building societies. All schemes of housing should be regulated by a special board on which the authorities concerned with health, engineering and administration should be represented along with one or two persons of experience who may be non-officials. One of the chief causes of the development of slums in the country is the fact that in the planning of factories or other housing no attention is paid for the sufficiency of accommodation or for sanitary convenience. In big cities where housing schemes are under progress insanitary conditions prevail round about these big construction works through improper provision of accommodation for the labourers. It is therefore necessary that one of the conditions attached to construction operations whether by contractors or by the departments themselves should be the provision of necessary accommodation to the labourers with sufficient sanitary convenience and proper water supply. Although some of these terms are actually provided in the contract form of the Public Works Department, we regret that in practice we did not find these contractual obligations being insisted upon by the Public Works Department.

In places where land is not freely available tenements may be permitted but care should be taken to provide sufficient amenities such as schools, markets, play grounds, medical aid, etc. Where multi-storied buildings have to be constructed it must be remembered that both traffic arrangements and other facilities must be made available in proportion to the large population living in such multi-storied buildings. Similarly in cases where cattle are also accommodated in the com-

pounds of large houses, there should be provision for separate sheds in accordance with health bye-laws of the local municipalities.

10. Air Pollution

The problem of air pollution is an ancient one. Natural occurrences like volcanic eruptions, dust-storms, forest fires, decaying vegetation, etc. had been the cause of atmospheric pollution at different times, although their effects were transient and strictly circumscribed. With the dawn of industrial era for the economic development, the price that man had to pay was to create such conditions of pollution more or less on a permanent basis. The problems thus created, though mainly limited to industrialised and urbanised areas, are not confined to health hazards only but include many other aspects, such as social and economic problems, degeneration of objects useful to man, hindrance to industrial activity, decay of plant growth, etc.

(i) Sources of pollution: The sources of air-pollution in the present day civilisation are many. In addition to the naturally occurring pollutants on which man has little control, there are numerous gases, vapours, smoke, grit, etc., emanating from factories, workshops, chemical plants and automobiles, where combustion of some kind of fuel or the other is essential for the production of energy. Other sources include processes involving vaporisation of liquids or pulverisation of solids for industrial purposes. Domestic heating and cooking, particularly at high temperatures, can also be expected to contribute to the pollution of atmosphere.

With the development of the atomic reactors and with rapidly expanding application of radioactive materials in medicine, agriculture and industry, the possibility of radioactive contamination of air has become an added danger. The adverse health effects of radioactive contamination are manifold and unfortunately of cumulative nature. The possible genetic effects of such contamination of the environment perhaps constitute a real threat to the living organism.

(ii) Types of pollutants: Evidently, the type of pollutants in any area depends on the nature of the source. However, they may broadly be divided into smoke and suspended matter, gases and vapours like sulphur dioxide, hydrogen sulphide, oxides of nitrogen, carbon monoxide, chlorides, fluorides, etc., aldehydes, acetone and polynucleic aromatic hydrocarbons, radioactive isotopes and allergenic pollens. As has already been mentioned, the common contaminants are those emanating from factories and automobiles, isotopes and allergenic pollens. As has already been mentioned, the common contaminants are-

those emanating from factories and automobiles due to complete or incomplete combustion of coal, coke and other fuels.

While some of these contaminants are harmless, there are others, which when present in the atmosphere in certain concentrations, are most injurious to human health. An aspect that has to be borne in mind, however, is the role played by the climatic conditions and the sun's rays in bringing about certain inter-actions among the apparently less innocuous substances leading to products with altered biological properties. For example, oxides of nitrogen and hydrocarbons present in the atmosphere as a result of combustion of petroleum products, when exposed to sunlight, produce materials which cause irritation to the eyes, damage the vegetation and favour formation of "smoggy" conditions. In addition, certain weather conditions *per se* like inversion of temperature, etc. are known to lead to accumulation of pollutants in the atmosphere to levels which are injurious to man.

(iii) **Health hazards of air-pollution :** In addition to minor nuisances like bad odours and irritation of the exposed mucous membranes etc., various specific and non-specific illnesses have been attributed to exposure to conditions of atmospheric pollution. Episodes of increased morbidity and mortality due to unexplained respiratory illnesses have been reported during periods characterised by increased atmospheric pollution.

Exposure to specific occupational situations is known to lead to certain specific diseases. *Pneumoconiotic diseases*, like *silicosis* (exposure to silica), *bagassosis* (exposure to dust of sugar cane waste), *byssinosis* (exposure to cotton-dust), etc., are examples of this nature. In recent years it has also been reported that deaths due to lung cancer among non-smokers in certain urban areas where atmospheric pollution with carcinogenic substances like *banzpyrene* (polynucleic hydrocarbons) has been shown to be occurring, are nine times more common than in the rural areas free from such contamination.

It may thus be noted that a variety of illnesses like irritation to the eyes, nose, throat and respiratory tract, fevers with cough and breathlessness, various allergic manifestations, specific diseases like *pneumoconioses* and even malignant diseases may be encountered in increasing numbers in situations of atmospheric pollution of one kind or the other.

(iv) **Air-Pollution problems in India :** In recent years there has been a remarkable increase in industrialisation and consequent urbanisation in this country. It has been estimated that in certain big cities of India there has been a two to three hundred-fold increase in

population. Numerous new industries have been established and many more are contemplated. There has been an enormous growth of motor traffic in these urban areas which are largely overcrowded at the same time. In spite of all these trends, which can be expected to lead to greater pollution of the ambient air in the urban areas, very little attention was apparently paid to this problem till recently. The Indian Council of Medical Research made a small beginning in this direction in the year 1955 by financing an enquiry to study the air pollution problems in India's major, industrially advanced and densely populated city of Calcutta. The study included estimation of important air contaminants, viz., air-borne dust, soot, sulphur dioxide, oxides of nitrogen, ammonia, aldehydes, etc. covering the various months of the year. Wherever possible, attempts have been made to bring out the diurnal and seasonal fluctuations in air pollution. The results observed are summarised below :—

Range.

Soot fall	39.4 to 91.0 tons per sq. mile per month.
Sulphur Dioxide	.02 to .06 part per million.
Oxides of Nitrogen	.04 to .12 parts per million.
Ammonia	.16 to .27 parts per million.
Aldehydes	.04 to .12 parts per million.
Respirable dust	.07 to .60 mgs. per cu/m of air.

Although the source of contamination was nearly constant throughout the year, relatively higher concentrations of air-borne dust and "smoggy" conditions were observed more in winter months, perhaps because of weather conditions like temperature inversion. The air contamination in rural Bengal was found to be negligible. It is, however, difficult to evaluate the extent to which the air-pollution detected in Calcutta is responsible for the ill-health in that city. This difficulty arises because of lack of yardsticks for the maximum permissible concentrations of the above said pollutants in the atmospheric conditions prevailing in Calcutta. It may be noted in this connection that yardsticks developed in one part of the world or in one industry are not necessarily applicable to another part with its own climatic peculiarities. The study, however, highlights the need for further investigations on this problem particularly in cities where rapid industrialisation is taking place.

(v) Recommendations: As is evident from the above account, the sources of air pollution are many and the effects of such pollution on human health are multifarious. In view of the recent strides in industrialisation and other changes conducive to atmospheric contamination, we are of the opinion that the problem of air pollution in

bigger cities of India should be given the attention it deserves. The needs in this regard are three-fold, namely (1) research, (2) establishment of a monitoring machinery and (3) legislative provisions to avoid or reduce air pollution.

(1) **Research:** As mentioned earlier, very little information is available today on the degree of contamination that is taking place in the vulnerable regions and on the safe limits of various pollutants under conditions obtaining in those regions. Investigations in this direction are urgently indicated. In addition, studies on local climatological factors, the role played by such factors in the mitigation or enhancement of dangers of air pollution, chemistry of the various pollutants and their effects on human physiology etc., require to be undertaken intensively. Any study of the health hazards must consider both the single pollutants and the additive effects of various combinations of contaminants. Micro-chemical techniques might have to be developed for measuring the concentration of the pollutants some of which are present in extremely small proportions.

(2) **Monitoring Machinery:** A machinery should be created to assess the degree of contamination occurring in the susceptible zones, to determine the maximum permissible levels of different contaminants in different situations, to fore-warn the danger of exceeding the safe levels, to recommend appropriate measures for prevention or mitigation of air pollution and to ensure prompt action being taken whenever indicated. This system of monitoring, though considered essential for the control of radio-active air pollution, can be fruitfully extended to cover contamination of air with other substances.

(3) **Legislative Provisions:** Legal measures to control atmospheric contamination with industrial smoke from coal in and around Calcutta were first taken in India in the year 1905 by the then British Government. This was apparently followed later by other similar Acts covering Bombay and Kanpur.

We are of the opinion that such legislative measures as are in vogue must be revised from time to time depending on the experience gained and provision should be made for the effective implementation of the same. A national air pollution control policy especially to cover the industrial areas will have to be developed in due course.

II. Maternal and Child Health :

(1) **Recommendations of the Bore Committee:** The Bore Committee recommended that measures for the reduction of sickness and mortality among the mothers and children should have the

highest priority in the programme of health development in view of the high rates of morbidity and mortality prevailing among them.

For providing health services to mothers and children in a primary unit there should be a woman doctor, 4 public health nurses, 4 midwives and four trained dais, dispensary at the headquarters of the units with 4 beds of which 2 will be for maternity cases and a 30 bedded hospital for four primary units. At the headquarters of the primary unit and at the places having 30 bedded hospitals there should be a medical officer.

The functions of a Maternal and Child Health Centre should be to get in touch with as many pregnant women in the area as possible and to persuade them to visit the clinic regularly, to provide for the skilled assistance of a midwife or trained dai at the time of delivery and for domiciliary visits, to keep the mothers and children under observation, if possible, for a year, to teach mothercraft in all its branches and to inculcate sound hygienic habits in the mother and child, to keep children under observation till they attain the age of 5, to arrange periodical talks by suitable persons, for husbands and fathers in order to secure their co-operation in the development of a healthy and happy home and in general to make the centre a focus of social activity. In addition a playground for children of two to five years of age should be provided as close to the Maternity and Child Health Centre as possible. In the 3 sub-centres of a primary unit there will be a public health nurse, a midwife and a trained dai. The Medical Officer of the Primary Health Unit should visit these sub-centres once a fortnight.

At the secondary health centre there should be, to begin with, a 200 bedded hospital with 50 maternity beds, later on developed into a 500 bedded hospital with 125 maternity beds.

At the headquarters of the province there should be on the establishment of the Director of Health Services a competent woman doctor to organise health services for women and children.

The Health services for mothers and children should also provide for the supplementary diet of pregnant women, nursing mothers and growing children. The grant of maternity benefits and compulsory abstention from work for a period of six weeks before and six weeks after confinement for all working women also formed part of the Bhoire Committee's recommendations. A provision of nurseries or creches to relieve the mother from the responsibility of the care of child during working hours was recommended. Strict control should be exercised by

local health authorities over the establishment and maintenance of private maternity homes.

School Health Services are practically non-existent and where they exist they are in an under-developed state. The functions of a School Health Service should include detection and treatment of defects, creation and maintenance of hygienic environment, and measures for promoting positive health of school-going children. Improvement of the nutritional status of the child, physical culture and health education should be part of a School Health Service. The Bhole Committee suggested that the Medical Officer in-charge of a primary unit should be in-charge of the School Health Service.

To begin with, the School Health Service should be restricted to primary school children. At least two teachers from each school should receive training in certain elementary health duties and should receive additional remuneration for this work. Such a School Health Service should first be developed close to the headquarters of a province in association with the department of preventive and social medicine located in a medical college there. The next stage would be the extension of the programme to the districts, through the secondary and primary units. Finally the programme should cover whole area of individual primary units. At the headquarters of each primary unit, there should be a school clinic which should not only treat minor ailments but should also undertake specialised types of service for dental, eye, nose and throat conditions. Follow up work should be done by the public health nurse. Periodical meetings should be arranged at the school health clinic for bringing together children their parents and the teachers and for giving educative programmes to them through films, talks etc.

(ii) **Present Position:** It may be mentioned in this connection that prior to 1947, maternity and child welfare services were looked after by certain voluntary organisations like the Indian Red Cross, Kasturba Gandhi Memorial Trust, etc. In 1948 the Government of India impressed upon the States, the need for strengthening their maternity and child health services. A post of Adviser on Maternity and Child Welfare was created in the Directorate-General of Health Services.

Attention was paid first to the training of health workers to man the services. Maternity and child health bureaus were set up in the States. Maternity and child welfare projects were undertaken in 12 States with the aim of improving and increasing the training of health personnel, establishing model health services and strengthening the administration of maternity and child welfare services at State and local levels.

Provision was made in the First Five Year Plan for the expansion of maternity and child welfare services particularly in the backward areas. The Department of Maternity and Child Welfare at the All India Institute of Hygiene and Public Health, Calcutta, was expanded. The Government of India gave financial assistance to State Governments for the establishment of 200 maternity and child welfare units. It may be added that the UNICEF gave equipment to several hundred maternity and child welfare centres. At the end of the First Five Year Plan, there were a total of 1,069 maternity and child welfare centres in the States. Improvement and expansion of nine health schools which were training health visitors, midwives, auxiliary nurse midwives, was also carried out in the First Plan.

In the Second Five Year Plan, maternity and child welfare services became an integral part of the primary health centres.

There are at present approximately 4,500 maternity and child welfare centres in urban and rural areas of States, apart from the Primary Health Centres. As against 12,000 maternity beds in 1946, there were 20,000 in 1959. The number of paediatric beds increased from 600 in 1946 to 2,000 in 1959. Maternal mortality decreased from 20 per thousand in 1946 to 10 per thousand in 1959. Infant mortality decreased from 165 per thousand in 1946 to 135 per thousand in 1959. Neo-natal mortality accounted for 50 to 60 deaths per thousand births; and still-births accounted for 40 to 50 per thousand births. The commonest causes of neo-natal mortality are prematurity, gastro-enteritis, pneumonias, etc. The morbidity pattern of pre-school children is upper respiratory infections, gastro-intestinal infections and skin infections. The commonest causes of morbidity in pregnancy are toxæmias (5% to 30%), anaemias (50% to 60%).

The average number of maternity beds works out to 0.14 per 100 births, although in the urban areas the ratio is about 1.2 bed per 100 births. It may be pointed out that in urban areas the demand for maternity beds and institutional deliveries has increased considerably, with the result that the hospitals in large cities are overcrowded and the mothers have to be discharged as early as the third day of confinement. In rural areas, however, the demand for home delivery and domiciliary midwifery services still continues and more than 90% of the births take place in homes. Only 20% of these deliveries are covered by the staff of the primary health centres and the maternity and child welfare centres.

Attention is being paid to ante-natal care to some extent. In large teaching hospitals 10% of the maternity beds are earmarked for ante-natal care. The maternity and child welfare centres in urban and rural areas and the primary health centres provide facilities for ante-

natal and post-natal care. Some of the maternity and child welfare centres give diet supplements, milk, iron and vitamins.

We have to observe, however, that the developments that have taken place in the field of maternity and child health so far, have not touched the fringe of the problem yet. Large numbers of paediatricians, midwives, auxiliary nurse midwives and rural health workers have still to be trained. Child care facilities have to be increased; special institutions for children need to be provided for; the nutritional programme for children requires emphasis; immunisation against small-pox, tuberculosis, diphtheria etc., needs to be made universal. The nutrition of the mother is a matter of paramount importance and greater attention deserves to be paid to it.

(iii) *Recommendations*: Before outlining any proposals, we would like to refer to some aspects of the problem which we feel bear repetition and re-emphasis. With the age structure of our population as it is, greatest attention should rationally be given to the care of the health of the children. In so far as this has been given a secondary place in the scheme of things, the order of priorities must be said not to be in keeping with the needs. Both in respect of training facilities and in the matter of services, whether for midwifery or for paediatrics, the sense of urgency that should be there for what are after all needs of a fundamental nature, is not much in evidence. Even in such urban areas where provision exists for ante-natal, midwifery, post-natal, infant and child care services, there is unfortunately little co-ordination and follow-up from one stage to another. The services rendered are thus disjointed and there is no agency to ensure that a systematic follow-up takes place by the M.C.H. Centre, the hospital and the school clinic acting as parts of an organic entity. Efforts have been made sporadically in this behalf by the maternity and paediatric departments of some teaching hospitals, in association, in some cases, with the departments of social and preventive medicine. It is time that this work be systematically organised in at least the larger urban centres based on teaching hospitals, so as to serve as demonstration projects.

There is another aspect of this question which deserves attention. "Health" even though important, is but one of the facets of child welfare services. The local health authorities are involved directly or indirectly in the health, educational and recreational aspects of such programmes in most western countries and the necessary planning and co-ordination is therefore possible at the local level. In India, however, with the Governmental agencies largely in the picture, planning and direction tends to be remote, uncoordinated, and compartmentalised between the Health, Education and other departments. This may

be said to be so even in the case of activities of organisations like the Social Welfare Board, the Council of Child Welfare etc.

Co-ordinated activity on the part of all the agencies concerned with this matter at all levels from the Centre, State, District to the Block and village level, is therefore necessary. We are suggesting at another place Health Advisory Boards at the State and District levels representing Education, Housing and other departments. We suggest that all these Boards have a sub-committee on maternal and child health services representing apart from the health and education departments, also organisations like the Red Cross, Social Welfare Board and Council of Child Welfare.

We have mentioned in an earlier paragraph that over 90% of the confinements take place at home in the rural areas and of these not more than 20% are believed to be attended to by the trained staff from the Primary Health Centres and sub-centres. If it is remembered that this is the position in respect of 82% of the country's population, no further comment is necessary on the urgency and magnitude of the problem. Every effort should, therefore, be made to develop and expand the net work of primary health centres on the lines suggested by us elsewhere, so that within a period of ten years one midwife is in a position for 5,000 to 6,000 rural people supported by a Public Health Nurse and an Auxiliary health worker for twice that number.

Other recommendations we have to make in this matter, are listed below under various headings :—

(i) Training :

(a) Preventive paediatrics needs greater emphasis in the undergraduate curriculum. The departments of Social and Preventive Medicine in medical colleges should concentrate more on midwifery and paediatrics.

(b) Undergraduates, particularly women, should have more experience and practical training in ante-natal and post-natal care and in midwifery. Not enough maternity beds are available in some teaching hospitals to allow each undergraduate to do the normal quota of 20 cases. Training in midwifery should not be only institutional. A major part of it should be domiciliary.

A well staffed and supervised domiciliary midwifery units should form part of each teaching unit in midwifery.

(c) Midwifery, paediatrics and health education should receive emphasis in the orientation and refresher courses for the Medical Officer, Public Health Nurse and Auxiliary health workers of the Primary Health Centres.

(d) The output of Public Health Nurses, Lady Health Visitors, and Auxiliary Nurse Midwives needs to be increased quickly.

(e) Until better qualified and trained staff is available, training of dais already in practice in the villages, in hygienic and aseptic midwifery should be continued.

(f) As soon as a sufficient number of trained doctors, midwives and dais is available in any district or area, the practice of midwifery by persons other than those registered for this purpose should be stopped and made a penal offence.

(ii) Services :

(A) Urban areas

(a) Necessary as the expansion of the Hospital and Maternal and Child Health services is, co-ordination of the existing services is even more important. The Hospital and Maternal and Child Health Centres should serve as integrated units, full records of the case passing from one to the other.

(b) It should be the effort of the Maternal and Child Health Centres to contact and register all expectant mothers, to induce them to avail of the services of Hospitals or Maternal and Child Health Centres and to impart instruction in baby and mothercraft even where delivery is conducted by other agencies.

(c) Talks, demonstrations, film shows, group discussions, baby shows etc., should be regular features of the work of maternal and child health centres.

(d) Family planning education and advice should be integral part of the function of the maternal and child health centres.

(e) Home visiting and health education in the homes of the people should be an important duty of the staff of each maternal and child health centre.

(f) Maternal and child health centres should establish liaison and work in close co-operation with agencies like the Balvadis etc., for the pre-school children.

(g) Creches should be set up in offices, hospitals, commercial and industrial establishments. The institutions concerned should meet the expenditure and the creches run by voluntary organisations.

(h) Play-grounds should be provided for children between 2 and 5 years.

(B) Rural areas

(a) Until a sufficient number of trained midwifery staff becomes available for the rural areas, establishment of an understanding with the village *dal* should be one of the first objectives of the trained midwife posted to a Primary Health Centre, dispensary or rural hospital, so that the former is an ally rather than an enemy. The present situation is rather paradoxical in that the centre midwives do not have enough work in most cases, while there are only 3 to 4 midwives for a population of 60 to 70 thousands.

(b) The Lady Health Visitors, midwives etc., posted to Health Centres can do much more for health education, personal hygiene and nutrition etc., than is the case at present, instead of their waiting to give midwifery service when asked.

(c) Except for abnormal midwifery, confinements should be encouraged at the homes of the people and full use made of this opportunity for imparting correct health habits and attitudes to the entire family.

(d) The health centre, the referral and district hospitals would have to form part of an integrated complex with connecting telephone and ambulance services, to attend to the needs of abnormal midwifery, surgical procedures and blood transfusion.

(e) The district hospital should provide at least 75 maternity beds and 15 to 20 beds for children.

(f) The Primary Health Centres and other Maternity and Child Health Centres in the rural areas should take an increasingly larger part in programmes of immunisation of children and in the notification of births and deaths in their areas.

(g) Distribution of food supplements, like skimmed milk, multi-vitamin tablets etc., and nutrition education of the public should also be part of the activities of maternal and child health centres.

12. The Pre-School Child

While considerable thought and attention has been given in recent years to the questions of the health and welfare of the infant and the school child, a serious gap exists in regard to the pre-school child. It is only in recent years that this formative period of the child's life has begun to receive some attention. Until a reasonably good coverage and a reasonable standard of service can be reached in regard to infant welfare on the one hand and the school health service on the other, the children in the pre-school age, it is feared, are likely to receive scant

attention. The extension of the scope of M.C.H. services so as to include within their purview the pre-school child will, apart from other things, throw a strain on the centres which they are not in a position to bear in the present context of area, population and staffing pattern of the centres obtaining today. In the urban areas if the extension of the facilities of paediatric services, MCH centres, child guidance clinics and other such recommendations which we have made, are implemented, it should be possible for better child care services to develop to include within their scope the pre-school child. In the rural areas the improved pattern of the Primary Health Centre which we have recommended would also help in greater care being given to the health of the pre-school child than is possible at present. We have suggested elsewhere the setting up of creches for children and we understand that in some States Social Welfare Departments are promoting the programme of Balwadis. We feel that in the large majority of cases, the services of the nearest M.C.H. or Primary Health Centre or any other suitable medical institution could be utilised to look after the preventive, curative and health education aspects of the health work of the Balwadis. The nutrition of the child at this stage is a matter of the greatest importance and ways and means wherever possible will have to be found for supplementing the diet of the pre-school child. This, we suggest is a field in which voluntary and social welfare organisations could play a very valuable role.

13. School Health

Extensive surveys carried out in different parts of the country have brought out the high incidence of sickness and death in children in India. The incidence of diseases directly attributed to mal-nutrition and to preventible causes is very high. For example a recent country-wide survey has revealed a very high incidence of protein mal-nutrition among our children. A recent health survey of university students carried out in West Bengal showed that nearly 90% of the students exhibited signs of ill health, 67% of the students having defective vision. These examples establish the urgent need for the immediate institution of programmes designed to improve the health and nutritional status of children.

Provision was made in the Second Five Year Plan for a National Integrated School Health Programme but for various reasons this was not taken up. Thus, while no all-India programme was followed, some States instituted their own school health programme on a limited scale. In the urban areas school health services have been promoted by the Education Department, through School Health Leagues, etc., by realisation of a small contribution from the scholars and by providing the re-

sources for the employment of medical officers for carrying out a check-up of these school students. The facilities provided do not, however, extend to regular follow-up and medical treatment, particularly of the dental and eye conditions for which there is generally no provision in these schemes. In the rural areas, however, school health services are almost entirely non-existent except to a very limited extent round some Primary Health Centres. The UNICEF are providing assistance for the schools in the Primary Health Centres receiving assistance from that organisation by providing a water pump and sanitary facilities in the schools. As part of the School Health Programme, health education is proposed to be promoted by developing a programme in collaboration with the Education Departments of the States. A Central Committee has been set up for this purpose which has worked out a syllabus in health education for the teachers, and corresponding committees have been recommended to the State Governments. The Indian Council of Child Welfare in association with the Central Social Welfare Board is engaged in developing a programme of care for pre-school children through Balwadis.

It may be added in this connection that the Government of India set up a Committee in February, 1960 to assess the present standards of health and nutrition of school children and to suggest ways and means to improve them.

The interim proposals of this Committee in regard to a School Health Service, a School Feeding Programme and a Programme for the care of pre-school children will be found in Appendix B-18. The main recommendations of the Committee are :

(1) That the Primary Health Centres should serve as a base for the School Health Service. For this purpose the medical and ancillary staff of the Primary Health Centres will have to be strengthened so as to provide one medical officer for 5,000 children and their terms and conditions of service will have to be made more attractive.

(2) School health bureaus should be established in all State Health Directorates and co-ordinating committees representing the Departments of Education, Health, Food and Agriculture, Community Development and Social Welfare should be formed at all levels. School teachers should receive adequate instruction in health education during their period of training.

(3) A thorough medical examination of all pupils should be made at the time of their entrance into primary schools and again after an interval of four years. There should be provision for the treatment of defects detected on examination and for follow-up. Necessary arrangements should be made for this purpose with the nearest hospitals.

(4) The School Health Service should provide immunisation facilities in routine manner for smallpox and B.C.G. Necessary preventive inoculation should also be available at the time of epidemics.

(5) All schools should provide the required sanitary facilities and correct health habits and attitudes should be inculcated by requiring the use of these facilities and by health education being made an essential part of the school curriculum.

(6) Mid-day meals should be provided in all schools which should either be free or on a nominal charge and which should provide at least one-third of the daily calorie requirements.

(7) The raising of kitchen gardens in and around schools to produce vegetables, fruits and pulses for use in the school meals should be encouraged.

RECOMMENDATIONS

We have suggested in our recommendations on Administrative Organisation that advisory boards be set up at the headquarters and district levels in the States, in which will be represented the Departments of Education, Housing, Agriculture, Social Welfare, etc. These advisory boards, we hope, will play an important part in shaping and developing the policies and programmes connected with health services for children including School Health Service. For such programmes to be implemented, it will however be necessary for each Directorate of Health Services to have a strong bureau of School Health Service. It will be the responsibility of this bureau :

- (i) to plan and initiate School Health Service programmes ;
- (ii) to co-ordinate the activities of the Government, the local bodies and the voluntary organisations working or interested in this field ;
- (iii) to establish close liaison with the Education Department of the State with the object of mobilising the activities of the two departments for promoting school health and of ensuring that due emphasis continues to be given by the Education Department on health education in the teachers training programmes and in the school curricula.

The next most important step in the field of school health, which we consider necessary, is an improvement in the general hygiene and sanitation of the school premises and their surroundings. Unless the example of the teachers and the influence of the school environment is

in the right direction, no amount of theoretical health education or a health service for the school children can be expected to lead to any worthwhile improvement in the standards of health of the school population. We recognise that with the introduction of compulsory primary education and with the consequent increase in the demand for schools, the buildings that may be available for this purpose may be far from ideal. All the same, it is essential that every school must have (a) a source of wholesome water supply with hygienic facilities for the storage and use of drinking water; (b) sanitary facilities adequate for the number of students and teachers in the school; and (c) regular and proper cleaning up of the class rooms and the campus of the school. With a little effort and vigilance on the part of the Headmaster of the school it should not be difficult to ensure the observance of these conditions. The medical officers of the Primary Health Centres should consider it their duty to see that the sanitary facilities mentioned above are adequately maintained in every school in his area even if the school is not covered by a regular health service programme.

The production of a birth and vaccination certificate should be made compulsory for admission to schools. It should be the duty of the teachers to see that the lists of the scholars are prepared for their revaccination after three years and made available to the medical officer of the Primary Health Centre for arranging the necessary revaccination. The school staff should also actively assist in preparing and inducing the children for inoculation at the time of any epidemic.

The results of the school feeding programmes carried out in different States appear to be satisfactory and we would urge that these should be watched carefully and steps taken in the light of experience for future programmes. It should also be possible in a large majority of the village schools for kitchen gardens to be cultivated which apart from supplementing the school menu should also serve usefully the aims of education in nutrition. Copy of the Madras Govt. order of 1957 giving outline of a scheme for the supply of mid-day meals to pupils in elementary schools will be found in Appendix B-19.

We have given some thought to the question of providing adequate medical coverage to the school-going population. In what follows we have in mind mainly the rural areas. With the present state of development of health services in the rural areas generally it may, we feel, be too much to expect adequate coverage of the entire rural school-going population of about 60 million between the ages of six and eleven years through the 5,000 Primary Health Centres. The task will not be possible even if an additional medical officer was to be made available at each of the Primary Health Centres. If a provision is to

be made for a regular follow-up and for dental, eye and ear, nose and throat services, the difficulties of the situation will become even more obvious. We are suggesting at another place the proposed set-up of rural health services in which we have made allowances for the needs of the school health programme. Even so, we feel it will be some time before the primary health centre complex grows to an extent as to provide adequate medical coverage to the school children in the rural areas. The Primary Health Centre staff may not be able to cater to the school population except in say 20 to 25 villages in its neighbourhood. For the remaining portion of the block area, we suggest that the services of the private medical practitioners in the nearest towns should be made use of either through a system of per capita fee or by payment of an honorarium for doing the school health work. The periodical examinations and inoculations may be done by these doctors. For the treatment of minor ailments, the services of the Primary Health Centre should be utilised. The Primary Health Centre can also serve as a point at which the children needing examination or advice by the dental, eye or E.N.T. specialists can be referred for investigation by corresponding specialists when they visit the Primary Health Centre according to a prescribed programme. For cases requiring more detailed investigation or surgery the district hospital will have to be made use of. The mobile specialist and ambulance service which we have referred to in the section on medical care will have to be utilised for this purpose.

14. Nutrition and Food Adulteration

(i) Bhore Committee's Recommendations

The Bhore Committee correctly said that any national health campaign is concerned not only with prevention of disease but also with promotion of positive health. For the latter purpose the improvement of the nutritional status of the people is an essential step.

A resume of the recommendations of the Bhore Committee on the subject of nutrition, is given below :

In India there are both under-nutrition and mal-nutrition existing widely. Against an average requirement of 2,400 calories by an adult living an ordinary life without manual labour, and 2,800 calories by those who are doing heavy manual work, the nutritive value of Indian foods is only 1,750 calories on the average. The average Indian diet is, therefore, insufficient quantitatively as well as qualitatively. The main defects of the average Indian diet are insufficiency of proteins, mineral salts and of vitamins.

As a rise in agricultural production will automatically produce a general improvement in nutrition, it is necessary to establish agricultural, economic and food policies, having as their objective the betterment of diet.

Medical and public health workers should investigate the state of nutrition of the population and lay down standards and requirements of various improved foods which can be used as the basis of Government food policies.

Health organisations must be extended to include work in the field of nutrition among their recognised functions.

The Central Health Department should have a highly trained nutrition specialist to advise on the nutrition policy.

The Central and State Governments should have nutrition officers and nutrition sections which will carry out diet surveys, study the food habits of the people, investigate the incidence of mal-nutrition and deficiency diseases, pay attention to the nutrition of the vulnerable groups etc.

All public health workers should have a sound knowledge of nutrition particularly health workers at the periphery e.g., health visitors, health inspectors etc., who are in direct contact with the people. Deficiency diseases should be tackled without waiting for a general rise in the standard of living and general improvement in diet e.g., beriberi by distribution of vitamin B₁, goitre by use of iodised salt etc.

Maternal and child welfare services should be responsible for supervising the feeding of mothers and children.

Development of school feeding schemes which would include provision of suitable quantity of milk and which should supply as far as possible such foods that help to correct the defects in the home diet.

Development of institutional feeding e.g., hostels, jails etc., should be undertaken.

Industrial concerns must establish canteens for supplying good food at low cost.

Provision should be made for well balanced food in catering establishments for the public.

Schemes for providing meals to large groups through community feeding must be attempted.

Nutrition research units should be established at colleges and hospitals.

Hospitals should employ trained dieticians.

Training of Nurses in general should include training in nutrition.

The importance of diet in the causation of disease should be given prominence in the medical curriculum.

All children should be taught simple facts about food as part of health education.

The public should be educated in nutrition.

The consumption of milk must be increased by increasing its production considerably and by bringing down prices sufficiently low to be within the purchasing capacity of poorer sections of the population. The total increase in milk production will have to be at least 110%. Production of synthetic milk in India on a large scale should be encouraged.

The fishing industry will have to be developed considerably to meet the needs of the country.

The possibility of developing the production of food yeast at low cost should be explored.

The possibility of production of urea and its utilisation as cattle feed in order to promote the production of meat for human consumption should be explored.

The shark liver oil industry should be developed and protection given to it.

The desirability of processing and storing perishable food-stuffs during local and seasonal gluts should be investigated as part of the campaign for the improvement of the nutrition.

The organisations for the detection of food adulteration at Government levels should be developed. Food Analysts should be appointed in States and food laboratories established.

The Central Committee of Food Standards should be made a permanent organisation.

Sufficient deterrent punishment in respect of offences under the Food Adulteration Acts should be provided for.

The existing legislation for prevention of food adulteration in the various States should be standardised under an Act of the Central Legislature.

The principles of Agricultural Grading and Marking Acts should be applied to food products other than agricultural with the object of improving their quality.

(ii) Present Position

The overall deficit in the production of cereals, pulses, milk, sugar, fish, vegetables, fruits and other protective foods, that was noted by the Bhore Committee was generally due to the backwardness in the methods of agriculture, dependence on the vagaries of the monsoon and migration of the rural population to towns in search of gainful employment. To this could be added the occurrence of partition of India, which aggravated the situation by the loss of 7 to 8 million tons in food grains alone.

The First and Second Plans gave high priority to agriculture and intensified the programmes for greater food production and for the development of animal husbandary, poultry farming, marine and inland fisheries etc.

A study of the effect of these schemes on the food situation is revealing. No reliable statistics were obtainable regarding the production of cereals, pulses, milk etc., before 1952. Since then certain estimates have been made and these show that, on the basis of 14 oz. cereals per adult unit per day, the total production of cereals in 1957 was 6% more than the requirements and the actual availability was about 2.8 per cent more than what was required. On the other hand pulses, fruits, milk, sugar, fish, meat and eggs still showed a deficit between requirements and the actual availability in 1957. The quantity of cereals consumed is much more than the recommended allowance of 14 oz. In spite of the improvement in the total food production, it must be mentioned that the initial deficiencies were so enormous that the increases registered in recent years made but a slight impact on the deficits to be covered. Large gap therefore still remains to be covered in the production of all protective foods.

Particular mention may be made of the requirements of milk. To meet the recommended allowance per adult unit per day of 10 oz. (as against the ideal of 20 oz.) the total requirements for the adult units in 1957 were 33.7 million metric tons per annum. The production was 17.9 and the actual availability was only 15.2, thus showing a deficit of 55 per cent. It may be mentioned that at the time of the Bhore Committee report, it was estimated that the consumption per adult unit per day was only 5 oz. From the deficit for 1957 indicated above, it will be seen that practically no progress has been made in the situation during the last two decades. Actually the output seems to have decreased since 1951 from 19.6 to 17.9 and the availability has decreased from 16.7 to 15.2. The position of fruits and vegetables is still worse.

In spite of the priority given to agriculture in the two Plans, major emphasis has been on the increase of the production of food

grains only and adequate attention does not seem to have been paid to increase the output of protective foods as well. As long as this imbalance in the production of food stuffs exists there is bound to be an imbalance in the dietaries of a large section of the people in the country particularly the vulnerable groups.

We may now deal with the question of diet surveys which the Bhore Committee recommended. As a result of the recommendations of that Committee more provinces fell into line by establishing nutrition units. But still, today there are not more than 8 such nutrition units working in the States and Centrally Administered Territories. Nearly 90% of these surveys were from Madras, Bombay, Bihar and Andhra Pradesh while the majority of the rest from U.P., West Bengal and Madhya Pradesh. A few surveys were also carried out in Assam, Ajmer, Bhopal, Rajasthan, Mysore and Kerala. The surveys conducted both in urban and rural areas included families of farmers, labourers, petty traders, constables, clerks, teachers and industrial workers. Thus all these surveys with the exception of a few were confined only to the low income groups and no large-scale attempt has been made to study the dietaries of the well-to-do section of the population. Certain individual surveys were conducted by the Nutrition Research Laboratory, Hyderabad among the vulnerable groups.

These surveys have served to confirm certain basic defects in Indian diets. There is a relative preponderance of cereals and insufficiency of protective foods like milk, meat, fruits and vegetables. The result of surveys carried in institutions showed that the diets served to growing children and adolescents in hostels were both inadequate and ill-balanced. It also shows that there is a general lack of interest and awareness regarding nutrition even among the professional people. A scrutiny of the diet survey reports available during the last 15 years, indicates that there were no appreciable changes in the general food habits of the people or in their dietaries.

The general nutrition surveys, covering children of school-going age, industrial workers employed in plantations, textile mills and other factories, showed frank signs of deficiency among children. Signs attributable to the deficiency of proteins in the diet were predominant among infants and toddlers. The incidence of deficiency signs was relatively low among children of upper income groups. The surveys have indicated Vitamin-B Complex deficiency among rice eaters. The poorer sections of the population suffer from absolute mal-nutrition, the vulnerable groups amongst them being the worst hit.

The clinical studies made during the last few years showed protein mal-nutrition, endemic goitre, anaemias, Vitamin-A deficiency and

beri-beri. The existence of certain other diseases associated with faulty diets was also brought out e.g., lathyrisms, fluorosis, dropsy, peptic ulcer, vesical calculus. Cutaneous, gastro-intestinal and respiratory infection were found to be rather common among the under-nourished communities. Childhood tuberculosis was more frequent in children suffering from protein mal-nutrition. Worm infestation was a common feature in the under-nourished communities. Gross retardation of growth in children and gross under-weight in adults were found to be universal among the low-income groups in the country. The retardation was not confined only to physical growth but also involved certain other developmental processes in the body.

In regard to research work on nutrition, it should be mentioned that the Indian Council of Medical Research has played a predominant role in initiating, encouraging and co-ordinating nutrition research in the country. It has also been responsible for the growth and development of public health nutrition work. The Council renders financial support to institutions carrying out research in nutrition, provides technical guidance, promotes exchange of ideas and co-ordination by bringing together all the nutrition workers of India and publicises the results of applied research. The Council has its own expert Nutrition Advisory Committee and various sub-committees. It maintains the Nutrition Research Laboratory at Hyderabad. Financial assistance rendered by the Council goes to various medical colleges, universities and other institutions for research projects on subjects bearing on nutrition.

The activities of the Nutrition Research Laboratory at Hyderabad include in addition to researches into fundamental aspects of nutrition, the training of workers in research as well as in public health nutrition and the education of the public directly and indirectly on matters connected with nutrition.

Besides the laboratory at Hyderabad, the Council has two Nutrition Research Units located at Calcutta and Bombay, which undertake research on fundamental and applied aspects of nutrition.

Newer methods for estimation of nutrients, nutritive value of food stuff, effects of storage, processing and cooking on the nutritive value of food, physiological availability of nutrients, metabolic studies on the role of nutrients in the biological functions, their bio-synthesis, mode of action and physiological effects, metabolism, food technology and other miscellaneous investigations have been carried out very efficiently and with profit to the country.

Another institution which has done substantial work in the field of nutrition is the All-India Institute of Hygiene and Public Health,

Calcutta. The Department of Biochemistry and Nutrition in that Institute runs refresher courses in nutrition for the benefit of public health workers in the country, post-graduate courses in nutrition and allied subjects for the benefit of those who wish to specialise in this branch and also carries out fundamental and applied research on nutrition.

Mention may also be made of the activities of the Central Food Technological Research Institute, Mysore, which was established in 1950 for the purpose of dealing with certain important aspects of food technology, namely, better conservation, and more efficient utilisation of the country's food resources. Study of new and hitherto unfamiliar sources of food, preparation of concentrated composite food and food supplements and substitutes and demonstration and popularisation of improved types of food preparations are undertaken by this Institute.

The Government of India has appointed a Nutrition Officer in the Directorate General of Health Services since November, 1957, who keeps in touch with current developments in nutrition by having regular contact with research workers in institutions and also provincial nutrition sections. Seven State Governments and one Centrally Administered Territory have established nutrition organisations in their Public Health Directorates, as a result of the recommendations of the Bhole Committee. It should be mentioned however, that there is no uniformity in the composition of those nutrition units among the States. Funds allotted to such units are not always sufficient and the work of these units is not always well-organised.

The Army Nutrition Organisation of the Medical Directorate, set up during the Second World War, deals with the composition of military rations, development of special rations, quality of food stuffs purchased for the Armed Forces, nutritional care of the troops and last but not least nutritional research as applicable to the conditions in the Armed Forces. This Organisation works in liaison with civilian nutritional scientists.

Recently a non-official organisation called "Meals for Million Association of India" has been set up to organise and render relief and prevent mal-nutrition wherever possible.

We next come to the important question of training of nutrition workers. So far there are only 2 centres for this purpose, namely the Nutrition Research Laboratory at Hyderabad and the All-India Institute of Hygiene and Public Health, Calcutta. Against the requirements of thousands of such specialists in the country today there are believed to be only 50 such workers available. Added to that, there is no institution meant specially for training personnel who would be capable of

educating the public in matters relating to nutrition. In this connection it may be mentioned that the Bhore Committee had recommended the creation of Chairs for teaching of nutrition in medical colleges but during the last 12 or 13 years no medical college has done so.

Orientation in nutrition of doctors, public health nurses, health visitors, midwives, social workers, village level workers and school teachers is necessary in order to educate the public and make them nutrition conscious. We understand that the Indian Council of Medical Research is considering this aspect of the question and working out the syllabus for educating the health workers in nutrition.

It will be relevant at this stage to touch upon the question of school feeding programmes. Mid-day meal programmes in schools are in progress in the States of Madras, Andhra Pradesh, Bombay, U.P., Bihar, Madhya Pradesh, West Bengal and Kerala, but the number of school children covered is stated to vary between a few thousands to one lac of students. Each State has its own school meal programme according to local conditions. The school meals are supplemented by skimmed milk and Vitamin tablets donated by international agencies in some cases. The school meal provided is generally free of cost, except in a few areas where a nominal charge is made.

So far as feeding of expectant and nursing mothers and infants is concerned, the UNICEF have been supplying skimmed milk powder regularly since 1949 for this purpose. Expectant and nursing mothers and children below the age of 15 years are given one glass of reconstituted milk each day, and the supplies are made either through the maternity and child health centres or hospitals or orphanages or schools. A long range programme of skimmed milk feeding was started in 1954 in collaboration with the UNICEF. This was meant to cover a large number of expectant mothers and children in the community project areas. During 1957, for instance, the total number of beneficiaries was estimated to be 874,000 out of which 350,000 were mothers. Even here it was found that infants and toddlers had been sadly neglected and attention was given more to school children.

As suggested by the Bhore Committee industrial canteens in some of the big cities have been opened.

During the last decade some of the large hospitals in big cities have employed qualified dieticians in hospital kitchens. In the Second Five Year Plan 12 additional diet kitchens in major hospitals in States were set up.

Dissemination of knowledge in nutrition has been carried out by the Central and State Health Departments through posters, pamph-

lets, booklets in different languages. Radio broadcasts, film shows and exhibitions have also been used. It is however the general feeling that it has not had a direct effect on the people because of the rather routine methods of nutrition education being followed.

(iii) Food Adulteration

In accordance with the recommendation of the Bhole Committee the Government of India enacted the Prevention of Food Adulteration Act of 1954, which was brought into force in all States with effect from 1st June, 1955. Rules under the Act have been framed both at the Centre and in the States in consultation with the Central Committee on Food Standards. This Central Committee on Food Standards has been set up under the provisions of the Act and incidentally fulfils the Bhole Committee recommendation. The Central Government have also provided financial assistance to State Governments for the creation of laboratory facilities in States for food analysis. A Central Food Laboratory has been established at Calcutta, which acts as an appellate authority for disputes arising out of prosecutions under the Act.

We feel that the administration of the Prevention of Food Adulteration Act by the State Governments needs to be tightened up and the Act enforced more rigorously. It is understood that this question was considered recently by the Central Committee on Food Standards at a Seminar attended by representatives of Government (Central and States) and of the trade. The Seminar recommended inter alia that the Act needed certain amendments to enable its strict enforcement, that the services of Food Inspectors at present under the Local Bodies should be provincialised, that a maximum period for the disposal of prosecutions should be fixed, that zonal committees should be established to advise Government on better methods of enforcement of the Act in the zones concerned and that a separate wing should be set up in the Directorate-General of Health Services to administer the Act more efficiently. These recommendations are understood to be under the active consideration of the Ministry of Health.

We feel generally that a stricter enforcement of the Act is immediately called for and that appropriate steps, administrative and executive, should be taken in the matter at an early date.

It may be of interest to know that in February, 1959, the F.A.O. appointed Dr. W. H. Griffith as a Nutrition Officer for a period of one year to study and report on the plans of UNICEF'S expanded nutrition programme in India. In his valuable report he has dealt with the various aspects of the nutrition programme and

with the food and nutrition needs and policies in India. A condensation of Dr. Griffith's report is given in Appendix B-16. Also included in Appendix B-17 is a summary of certain interesting observations and comments made by Dr. J. D. Castro, Director of the Nutrition Laboratory, University of Brazil, in his book "Geography of Hunger".

The Government of India have since established a National Nutrition Advisory Committee in accordance with the recommendations made in the F.A.O. Conference at Rome in November, 1957. This Committee consists of 19 members with the Union Minister of Health as its Chairman and Union Minister of Agriculture as Pro-Chairman. Important matters connected with nutrition were discussed by the Committee. Several working groups were formed on "Production and Utilisation", "Training, Education and Extension Services in Nutrition", "Nutrition Programme and implementation of a National Nutrition Policy", "Nutrition Programmes in the Third Five Year Plan", "Priorities in processing, preservation and manufacture of essential foods", etc. The reports of the working groups were considered and the recommendations endorsed by the main Committee.

The National Nutrition Programme which has been proposed by the National Nutrition Advisory Committee may be classified under four headings as follows :—

(1) The most vulnerable segments of the population are the pre-school and school children. The only way to reach pre-school children is through the primary health centres and maternity and child health centres. Supplies of milk should be made through 250/300 rural centres and 500 urban centres during the first year and then 100 additional centres should be added every year.

(2) There are 580 lakhs of school children between the ages of 6 and 11. If one-tenth of this number is given meals at the rate of 10 to 12 nP. per day for 200 days, it will cost Rs. 40 crores during the Third Five Year Plan and it will remove deficiencies and produce better fitness, better attendance and better studies.

(3) Rupees 2 crores should be spent during the Third Five Year Plan for the training, education and extension services in nutrition.

(4) In order to utilise existing resources on a rational basis, there should be a legislation prohibiting use of milk in tea and coffee in restaurants and commercial preparation of sweets from milk. There should be free distribution of seeds of leafy vegetables for use in institutions and through community development blocks to homes.

(iv) Recommendations

We have referred to the report of Dr. Griffith and the thesis of Dr. Castro to emphasise the point that a sound nutrition policy involves collaborative effort on the part of the Ministry of Food and Agriculture, Community Development and Education besides the Ministry of Health, which can at best provide the technical know-how and guidance.

We feel that so far as increased food production is concerned a planned approach is necessary and that the 60 million acres of cultivable land still to be developed and 70 million acres of fallow land should be fully utilised for production of more food.

We recommend that for covering the deficiency in protective foods, milk production should be considerably increased. This can be done by production of more fodder and improving the breed of cattle. Poultry farming should be developed further. Fish production should be considerably increased by utilising the large resources we have in India. Special attention should be paid to the development of the production of vegetables and fruits, exploitation of neglected sources of vegetable protein foods, production of synthetic nutrients and processed foods, development of kitchen and community gardens, fish culture etc. in Community Development Blocks.

We realise the important aspect of over population in India as it affects food production and nutrition. The question of family planning and control of population has been dealt with in greater detail in another chapter.

Public Health nutrition services to the people at the periphery should be organised by creating more nutrition sections in States and by strengthening the existing ones on a uniform basis, by establishing State Nutrition Advisory Committees and by employing qualified nutritionists and dieticians in public institutions.

We recommend that provision should be made for increased nutrient intake by the vulnerable groups. These nutrients, e.g. iron supplements, protein-rich foods, vitamins etc., should be supplied in rural areas through rural health centres, maternity and child health centres, schools etc. and in the urban areas through similar establishments.

We recommend that clinical research units should be established in teaching hospitals for investigation of diseases associated with faulty diets, for studies in normal physical and physiological standards, for analysis of food stuffs and for a study of the effects of storage, processing, cooking etc. of foodstuffs.

We recommend that the training facilities for nutrition workers at the Nutrition Research Laboratory at Hyderabad and the All India Institute of Hygiene and Public Health should be considerably enlarged. A degree or diploma should be instituted.

We strongly recommend the setting up of a large number of institutions for the training of dieticians and nutritionists and nutrition workers.

We reiterate the recommendations of the Bhore Committee that Chairs for nutrition should be created forthwith in the medical colleges.

15. Goitre

We propose to deal with goitre in this chapter as one of the nutritional deficiency diseases prevalent in certain regions of India, namely the southern slopes of the Himalayas covering a distance of over 1,500 miles and consisting of the northern parts of Kashmir, Punjab, Himachal Pradesh, Uttar Pradesh, Bihar, West Bengal, Assam, NEFA and Manipur. The goitre belt passes from the Kangra Valley in Punjab through the Himalayan tracts of Tehri Garhwal, Almora and Nainital and sub-Himalayan tracts in Uttar Pradesh to certain districts of Bihar and West Bengal and ends in the Naga and Lushai Hills in Assam. There are probably 9 million persons affected with goitre in India.

The public health importance of goitre may be realised from the unfavourable effects on the population. Criticism occurs in areas where goitre has been endemic for a long period. Feeble-mindedness increases in such areas. There is a correlation between the incidence of deaf-mutism and endemic goitre. Endemic goitre may also be associated with an increased mortality, decreased production of mother's milk and retardation of growth in children and in the general health of the individuals. The easiest and surest means of prevention of goitre is to ensure an adequate supply of iodine. The field studies of McCarrison and of Stott suggested that bacterial pollution of water supply and excessive intake of calcium play an important part in the etiology of endemic goitre. Although adequate intake of iodine prevents endemic goitre, factors other than simple environmental deficiency of iodine may be primarily involved. Dietary factors seem to be important. Recent studies carried out in India show that persons suffering from endemic goitre exhibit increased avidity of thyroid for iodine. The Government of India in collaboration with the Government of Punjab and the Indian Council of Medical Research started a Goitre Survey Project in the Kangra district in 1953. As a result of this survey iodised salt is being supplied to 33 villages of Kangra and 16 villages of Palampur. A re-survey of these villages has been started in May,

1959 to assess the result of this medication. A central scheme for the control of goitre was included in the Second Five Year Plan envisaging estimation of the problem in areas where it is yet to be defined, supply of iodised salt to the inhabitants in areas affected with endemic goitre and assessment of the result of iodine and prophylaxis. One survey team which started working in Himachal Pradesh in March, 1959 has completed its work and has begun similar work in Uttar Pradesh. Another survey team undertook survey in Naga Hills in December, 1959. The Himachal Pradesh team found the average incidence in certain districts to be 28.8 per cent while in the Naga Hills the average incidence was found to be 24.8 per cent.

An Iodisation Plant capable of processing 70 tons of salt per day sufficient for a population of 2.75 millions has been set up at Sambhar, Rajasthan, with the assistance of the UNICEF. This programme needs to be extended so as to cover the entire endemic goitre area with iodized salt supply and we have no doubt that this simple expedient, suitably applied, can effectively eliminate the goitre problem from the goitre belt in the sub-Himalayas.

16. Mental Health

(i) Bhole Committee's Recommendations

The Bhole Committee found that the existing provision for the medical care of mental patients was altogether inadequate and unsatisfactory. They, therefore, recommended the creation of mental health organisations as part of the establishments under the Directorate-General of Health Services at the Centre and of the provincial Director of Health Services, the improvement of the existing mental hospitals and the establishment of new institutions, the provision of facilities for training in mental health for medical men and ancillary personnel in India and abroad and the establishment of a department of mental health in the proposed All-India Medical Institute.

(ii) Present position :

Reliable statistics regarding the incidence of mental morbidity in India are not available. It is believed that an enormous number of patients require psychiatric assistance and service. In India the ratio of mental patients is not less than 2: 1,000 of population, that is to say, about a million persons in India require hospital accommodation. This number does not include the large number of mental defectives who need both medical and psychological treatment, and the epileptics who average about one in two hundred of the population. Including mental defectives and psychotics and excluding psycho-neurotics, accommoda-

tion is needed for at least two million mental patients. If the psychoneurotics are also included, the requirements will be of the order of 6 to 8 millions. As against this the total number of beds available now in mental hospitals in India is only 15,000. There is hardly any provision for the education of mental defectives. Provision for the treatment of psychosomatic diseases in general hospitals is inadequate.

The All India Institute of Mental Health was established in July, 1954 as a result of the recommendations of the Bhore Committee, and started functioning in 1955 in association with the Mental Hospital, Bangalore. This institute provides facilities for post-graduate teaching and research. Its functions are chiefly to plan and conduct research on problems relating to mental health, to train psychiatrists, psychiatric nurses, occupational therapists and other personnel required to staff various mental hospitals and psychiatric clinics in general hospitals, to train psychologists and psychiatric social workers and to conduct survey on the incidence of mental morbidity and the biological and ecological factors that are responsible for mental morbidity. It conducts a 2-year diploma course in Psychological Medicine (D.P.M.) and a 2-year diploma course in Mental Psychology (D.M.P.). The diploma in Psychiatric Nursing is of one year's duration.

The Mental Hospital, Ranchi, which was previously under a Board of Trustees, has now been taken over by the Central Government with a view of reorganising it on sound lines and also making it a model centre for the treatment of mental disorders. There are 420 beds at this hospital.

Under a Second Five Year Plan scheme for the establishment of child guidance clinics and psychiatric departments in teaching hospitals, eight such units have come up in Andhra, Madras (2), Punjab, Uttar Pradesh, old Bombay State, Madhya Pradesh and Bihar.

(iii) Recommendations

(a) General: Having considered the comments and recommendations of the Bhore Committee and having taken stock of the present position regarding facilities for mental health care, we cannot help coming to the conclusion that there is a general sense of complaisance in regard to mental disease. This is perhaps born of the general impression that the incidence of mental illness in this country is not high. While no systematic representative surveys have been carried out, the estimates mentioned in an earlier paragraph should be sufficient to remove such an impression. There is, therefore, urgent need for the setting up of preventive mental health services, for the expansion and improvement of curative services, for the institution of training facili-

ties for meeting these needs and for research and survey programmes. The administrative organisation at the Centre and in the States would need to be geared up to meet these needs. In the preventive field there should be :

- (a) Provision for mental health services at pre-primary, primary and secondary schools by the employment of not only psychiatrists and psychiatric social workers, but also by the employment of school counsellors among the teachers who have undergone intensive training and who would be able to deal with children with emotional difficulties and other problems.
- (b) marital and pre-marital guidance in the social field.
- (c) child guidance and psychiatric clinics in all teaching and other major and district hospitals.

The following curative psychiatric services for adults need to be provided to a far greater extent than at present.

- (i) In-patient and out-patient departments at lay hospitals.
- (ii) Independent psychiatric out-patient clinics or mental health clinics.
- (iii) Institutions for mental defectives.

(b) Training: Training of Psychiatric and Mental Health Personnel.

Orientation in mental hygiene for various professional groups in the field of family welfare and child welfare such as paediatricians, school teachers, nurses, social administrators etc. All medical and public health personnel should be given orientation in the subject of mental health. In Appendix B-20 will be found a plan for starting schemes of training and psychiatric services on a pilot scale with the assistance of voluntary organisations and/or existing colleges and mental institutions.

(c) Research: Research to increase the knowledge of the multiple causes of mental diseases and disorders, research in the factors which promote positive mental health, studies of personal and educational problems of children, the studies of the genesis of unhealthy parent/child relationships, research in association with the practitioners of indigenous systems of medicine in the treatment of mental illness with a view to benefit from the rich and ancient heritage of Ayurvedic and Unani systems of treatment, study of the possibilities of integrating psychiatric teaching within the medical curriculum, study of the role of mal-nutrition in the etiology of psychiatric disorders, survey of the

incidence of suicides and factors in relation of psychiatric aspects of crimes, need to be undertaken.

There is an acute shortage of personnel trained in mental health. Psychiatrists, clinical psychologists and psychiatric nurses need to be trained in large numbers. We are glad to note the increased demand on the training facilities in the All India Institute of Mental Health, Bangalore. Such facilities need to be multiplied. The Ranchi Mental Hospital should be developed into a full-fledged training institution and ultimately each region if not each State should become self-sufficient in the training of mental health personnel.

We are referring elsewhere to the questions of training psychiatric nurses and amendment of the Lunacy Act.

17. Health in Industries, Plantations, etc.

We are dealing with this in detail in the chapter on Medical Care. We may, however, point out that in India about 34.7 lakhs of people work in factories, 12.02 lakhs in plantations, 11.43 lakhs in railways, 6.49 lakhs in mines and about 68,000 in ports. The total labour force is computed at 65.5 lakhs, besides those working in agriculture and the professions. Any suggested solution for improving the health of the nation cannot overlook this vast labour population in factories, plantations, mines, etc. We have to deal also with diseases peculiar to industries, the disablement caused thereby and the rehabilitation of such disabled persons. Housing of labour, their environmental sanitation, treatment facilities for occupational diseases, are still in an unsatisfactory state of development.

18. Vital and Health Statistics

(i) The changing trends :

The subject of statistics has become highly complex and specialised. Vital statistics had more a legal than a health bias originally and it was only after some time that significance as part of health statistics in general began to be fully appreciated. It can be used as an important tool in research, planning administration and evaluation of medical and health administration. It is through the intelligent application of this branch of science that health services are being lifted from the earlier empirical to a scientific basis. The statistics are now utilized for providing proper intelligence to scientists, research workers, planners and administrators in health fields to carry out their jobs with confidence and justification. Health intelligence, which is a much more comprehensive term, includes collection, compilation, analysis, evaluation, synthesis and dissemination of all information pertaining to health.

in order to plan and administer health services at national and local levels in a rational manner according to the findings of the Bhore Committee.

(ii) Bhore Committee's Findings :

The Health Survey and Development Committee brought out that vital statistics in India had three main defects viz.

- (i) incompleteness in the recording of the events ;
- (ii) inaccuracy in the cause of death ; and
- (iii) faulty compilation.

These defects were attributed to poor collection of vital occurrences at the periphery (in villages) by illiterate chowkidar or by the lowest grades of local body employees, registration by agencies other than health such as police, village headmen (Madras), passage of the recorded vital statistics through a series of stages before they reached the Directorate of Public Health of each Province. Thus the data on vital events were poorly collected, improperly handled and scarcely used for either operating or evaluating projects in the country. The Bhore Committee gave a number of recommendations to improve these defects viz. the creation of registration offices in Primary Health Unit areas in order to place the registering authority as close to the people as possible, transference of registration work from lay to paratechnical personnel such as public health nurses and midwives, better checking and follow up by house to house visits during their duty-rounds in villages, preparation of house lists in villages and sample surveys, provision of adequate incentives to the people for registration of births and deaths—like production of birth certificate for proof of age at the time of admission to schools, or entry into service and death certificates for insurance benefits and others, compulsory registration of vital statistics through the enforcement of law, creation of a post of Registrar-General of Vital Statistics at the Centre and recommendation for the establishment of Central and provincial organisations with sufficient number of statisticians both for general purpose and single purpose statistics e.g. industries. In short the recommendations were based on the principles of decentralisation, specialisation and integration.

(iii) Developments after the Bhore Committee's Report :

The following developments have taken place in the field of vital and health statistics.

(A) Increased recognition for the need of accurate and complete data of vital and health statistics :

A number of Conferences have been held emphasising the importance and role of health statistics in the field of Public Health Administration :

The Second Health Ministers' Conference, 1948 stressed the need of finding ways and means to give effect to the Bhole Committee recommendations both in rural and municipal areas and made suggestions for centralised compilation through the introduction of machine units at the headquarters of the Directorates of Medical and Health Services in the States.

Inter-departmental meeting for improvement of vital statistics 1956 — resulting in the constitution of inter-departmental standing Committee for co-ordination of population and vital and health statistics.

The Central Council of Health appointed a sub-committee in (Jan., 1959) on vital statistics. The report of this Committee was approved by the Council and commended to the Central and State Governments.

A Vital Statistics Conference represented by the Registrar-General, Directorate-General of Health Services, Directors of Health Services, Health Secretaries, Health Statisticians—from States and Centrally administered areas was held in 1961 (April).

(B) International Co-operation and collaboration :

The W.H.O. and T.C.M. authorities have been joining hands with the Government of India for bringing about improvements in this field by lending experts, offering fellowships and organising conferences and also by extending invitation to Indian experts to participate in international conferences held outside India. A seminar was held on *Certification and Classification of morbidity and mortality* under the auspices of the W.H.O. in October, 1958. A number of experts have been assigned by the World Health Organisation and T.C.M. of the U.S. from time to time, for specific projects like the Nagpur Model Vital and Health Statistics Unit or to advise the Corporation on the reorganisation and development of the Vital Statistics machinery at the Centre and in the States. Some valuable studies and recommendations have been made by these experts.

World Health Organisation, T.C.M. and Rockefeller Foundation authorities have provided opportunities for specialisation to workers engaged in this field by the grant of fellowships for study abroad.

(C) Training Facilities :

(i) Facilities for training of statisticians in medical statistics have been provided at the All India Institute of Hygiene and Public Health, Calcutta in collaboration with the Indian Statistical Institute, Calcutta for nominees of State Governments. This scheme has however, not progressed according to schedule and needs a review.

(ii) Model Vital and Health Statistical Unit, Nagpur in collaboration with World Health Organisation, the State Government, Nagpur Corporation and the Government of India was established in 1956. The Unit conducts a training programme for medical coders, statistical assistants and offers an orientation course to health officers from all over India.

(D) Changes in personnel structure :

At the time of Bhore Committee's recommendations there was hardly any specialisation but with the growth of training facilities in this field, various categories of personnel like Senior Statisticians, Junior Statisticians, machine tabulators, statistical assistants, computers, coders, medical records officers etc. are coming up.

(E) Developments at the Centre :

(i) Establishment of the office of the Registrar-General and ex-officio Census Commissioner in the Ministry of Home Affairs to deal with population statistics including vital statistics in the year 1949.

(ii) Establishment of Central Statistical Organisation in 1951.

(iii) Health Survey in Community Project areas :

A restricted health survey was carried out in 9 selected Community Development Blocks during 1955-58 to collect base-line data and incidentally to evolve methodology for such surveys in future. Valuable information has been thrown up by these surveys.

(iv) Establishment of Single-purpose Statistical Units for Contributory Health Services, Family Planning, Health Units, B.C.G., etc., in the Directorate-General of Health Services, New Delhi.

(v) Establishment of an Epidemiological Cell in the Directorate-General of Health Services in 1960 to deal with epidemic intelligence and to help and advise in the investigation of epidemiological problems in the States.

(vi) Establishment of morbidity survey unit on an experimental basis under Indian Council of Medical Research confined to the beneficiaries of Contributory Health Service Scheme in 1960.

(vii) Reorganisation of the existing Statistical Bureau into a Central Bureau of Health Intelligence (1961) and to make it more comprehensive in function for providing reliable and necessary intelligence to the Central and State Health Ministries, the Central and State Health Directorates and other related organisations. This Bureau is to centralise collection, compilation, analysis, evaluation, synthesis and dissemination of all information on health statistics in one place and under one direction for the nation as a whole and thus help in the planning and administration of health services and organisation of medical research at the Central and State levels. The Bureau is expected to be provided with a 80 Column Mechanical Tabulation Unit.

(viii) Two weeks orientation course to hospital superintendents in organisation, preservation and utilisation of medical records at the Christian Medical College, Vellore, 1960-61.

(ix) A scheme for the establishment of a Medical Records Department at the Safdarjang Hospital, New Delhi for training of medical records officers to man medical records departments in the country is understood to be awaiting implementation.

(F) Developments in States :

(i) Establishment of Statistical Cells in the State Health Directorates.

(ii) Reduction of intermediaries in the transmission of vital and health statistics between the periphery and the State headquarters in some States.

(iii) Centralised compilation with the provision of machine units in some of the State Health Directorates.

(iv) Transference of registration of vital events from police agency to health agency in some States whereas in others it is in the transitional stage.

(G) Developments in Corporations :

Nagpur Corporation is developing a model unit for collection and compilation of vital records and for demonstration and training of statistical workers in the country. Delhi Corporation is believed to have decided to establish one such unit. Poona Corporation has also an efficient Statistical Unit.

The Medical Records Department of Christian Medical College, Vellore deserves mention. It is a very well organised department and is likely to play an important part in training of Medical Records Officers.

The developments enumerated above notwithstanding, the various stages in the collection, compilation, preservation and utilisation of data on vital and health statistics are still passing through a transition. Whereas the compilation and preservation phase has improved to some extent in some States and Corporations, the collection and registration phases are still what they were, at the time of the Bhole Committee's recommendations.

(4) Recommendations :

Health Statistics should not be confined to disease alone but since man's health is influenced by his social, economic and cultural environment, health statistics must include in future information on the social, economic and cultural pattern of the community as much as on the biological aspects of sickness and health. Demographic picture, housing, employment, welfare and other related social conditions must, therefore, figure in health statistics.

At present the health statistics data originate from three district sources viz., (a) statistics compiled from returns and reports required by law mainly on birth, death, marriage and notifiable diseases, (b) statistics derived from the returns of plan projects and operations of health programmes and (c) statistics collected through special and general surveys. But almost all health statistics are cross-sectional by nature and deal with conditions as they exist at a particular point of time and hence suffer from the obvious defect of not revealing the continuous changes going on in the community. On the other hand longitudinal studies can be taken up so that the results obtained obviate the aforesaid defect by following the course of events in the same group of individuals through repeated observations over a period of time. More and more longitudinal studies should be made in future for purposes of problem measurement and concurrent evaluation.

Establishment of State Bureau of Health Intelligence. Co-ordination between Vital and Health Statistics work through collaboration with Registrar General and international agencies.

Centralised mechanical tabulation in major states. Development of specialised branches of Health Statistics — e.g., medical records departments in major hospitals throughout the country.

Establishment of training centres for medical records officers and other assistants in different zones of the country.

Establishment of training centres on the lines of Model Vital and Health Statistics Unit, at Nagpur to train various categories of person-

nel engaged in health statistics work in various states, corporations and other organisations in the country.

Orientation course in training centres for senior and junior types of health workers in the country. Co-ordination between democratic decentralised agencies and the health departments to secure complete, effective and regular reporting of vital events.

Stabilisation of Health Statistics course at the All India Institute of Hygiene and Public Health, Calcutta for senior workers in the field.

Enactment of a Central Health Statistics Act to bring about uniformity in collection and reporting throughout the country.

19. Health Education

(1) Bhole Committee's Recommendations

The Bhole Committee pointed out that health education meant not only instruction in purely health matters but also those activities which are likely to influence favourable individual health knowledge, health attitude and health habits. The progress of Health Education in India had been slow. The standards of teaching of hygiene in schools were low because of the poor content of the syllabuses and the methods of teaching of hygiene in schools by persons not adequately subjected to such a task. Health education among the general population was also not of any worthwhile standards as compared to other countries. The Bhole Committee, therefore, recommended that the instruction of children in hygiene should begin at the earliest possible stage and should be entirely practical and devoted to the formation of health habits and promotion of personal hygiene. The student should see in actual operation the sort of hygienic and sanitary arrangements he is taught. School clubs, societies and organisations can actively help in the development of health education programmes for school children. The Health Departments of Governments have a responsibility for assisting and guiding the health education of the general population. For this purpose they should constitute a health publicity bureau as part of the Central and Provincial Health Departments, whose functions should be participation in the active promotion of health education among all sections of the population, to give advice and help the provincial health departments in the matter of health propaganda and publication of an Indian Health Journal. Health propaganda, being highly specialised work, should be entrusted to capable hands. The methods of propaganda employed by commercial organisations should be studied and adopted as far as possible in the development of health education campaign. Lastly the permanent health museum should be established in the larger towns and cities.

(ii) Present Position

During the First Five Year Plan, it was realised that all progress in public health depends ultimately on the willing assent and co-operation of the people. The importance of reaching different sections of public in a manner suitable to each class was emphasised. The inculcation of health habits among the school going population was considered to be vital. Hygienic facilities were to be provided in the school premises and health education was to be included as a compulsory subject in the teachers training institutions. Health publicity among the adult population in places of work, recreation or at home was recommended. Properly staffed health publicity bureaux in the Centre and States were also envisaged. The plan also envisaged that publicity work should form an integral part of the Health organisation work in co-ordination with voluntary agencies. But in actual practice nothing could be achieved in the field of health education during the First Five Year Plan, although a provision of Rs. 12 lakhs was included therein. A scheme was taken up during the Second Five Year Plan and the establishment of a Central Health Education Bureau was achieved. The functions of the Bureau are :

(a) to interpret the services of the Central Health Ministry so as to win the support for a maximum use of its various services ;

(b) to procure and publish health education material for distribution throughout the country ;

(c) to help Central Health Services, and voluntary organisations and State Health Ministries requesting technical assistance ;

(d) to promote and co-ordinate health education work in the country, particularly by initiating and conducting specialised research, studies, and effective use of education by health workers throughout the country ; and

(e) to represent the Central Health Services and work with organisations interested in health on a countrywide basis particularly on projects in which education is the principal method likely to be used in reaching the objects of the health education.

It might be added that the Central Health Education Bureau was established in 1956 with the assistance of the United States Technical Co-operation Mission. Previous to this there was a small publicity section in the Directorate-General of Health Services. The Central Health Education Bureau consists of a method and media division. The media division has several branches namely the editorial, films, and photography, museum and exhibition and art units. The methods division

has under it the subjects of training, research and evaluation, field services and demonstration units. The Central Health Education Bureau has been publishing a monthly health bulletin entitled 'Swasth Hind'. A large amount of health education material has been put out by the Bureau. A School Health Section was formed in the Bureau with the assistance of the World Health Organisation. This section has now taken up the task of surveying the syllabuses in hygiene and health currently in use in primary and secondary schools and teacher training institutions and making suitable modifications to conform to modern health concepts. In this task the Ministry of Education are also collaborating. In 1959 the Central Council of Health resolved that since health education of the various social groups of population can only be undertaken by State Governments, it is they who should actively consider the building up of Health Education Bureaux as part of their Health Departments. A scheme for establishing State Health Education Bureaux was therefore formulated by the Central Government and it has been accepted by almost all the States. Besides the information of the State Bureaux the scheme envisaged the field study and demonstration centres each in two Community Development Blocks. At present five States have the Health Education Bureau. Health Education courses have been started at the All-India Institute of Hygiene and Public Health, Calcutta, and at the Central Health Education Bureau for the purpose of training personnel. The State Bureaux will also provide in-service training to personnel working in the State Health Directorates. A beginning has been made in the Central Health Education Bureau to find out the best methods and media for dissemination of health information and for development of health attitudes and habits among the people. Similarly investigations and research will be done by the State Bureaux. In this connection attention may be invited to the three research-cum-action projects assisted by the Ford Foundation and in the Family Planning Communication studies in progress under the aegis of the Indian Council of Medical Research.

(iii) Recommendations

We would recommend that in view of the great importance of the subject, all States should establish Health Education Bureaux and in co-operation with the Central Health Education Bureau promote the cause of making the people in India health conscious.

There is a Health Museum at present at Hyderabad which some of the Members of this Committee visited with profit. It is understood that the Central Health Education Bureau is shortly proposing to start a health museum in Delhi.

20. Physical Education :

(i) Recommendations of the Bhole Committee

The Bhole Committee stated that during the last 20 years revolutionary changes have taken place in all civilized countries in the concept and content of physical education and training. There were only 5 physical education colleges in India at that time and at a rough estimate the total number of physical training teachers trained at these institutions during the preceding 20 years did not exceed 3,000 which was far too small a number for the needs of the country. They, therefore, proposed that there should be one or two physical training colleges in each Province granting a recognised qualification and that in addition physical education should be made a compulsory subject in all schools. It was also recommended that a certain number of qualified physical training instructors should be sent abroad at State expense for higher training and on their return they should be employed at responsible teaching and administrative posts where their special training would be of value. In the beginning a single organisation may be developed to serve the needs of school and college students as well as of the general public. The school teacher should be utilised for this programme. It will be necessary to establish a suitable organisation in each province as part of the provincial education department and in close liaison with the health department. The national physical education programme should include indigenous games, sports, folk dances, etc. Physical education should form part of the activity of the Education Departments.

(ii) Present Position

From information obtained from the Ministry of Education, Government of India, the present position in regard to developments in physical education, is as follows :

The programme for the promotion of physical education, generally based on the recommendations of the Central Advisory Board of Physical Education and Recreation, came up for serious consideration only in the 2nd Plan period. A national plan of physical education and recreation was drawn up. The plan made a survey of the facilities available for physical education in the country and offered valuable suggestions both immediate and long term for making them more effective. The Central Board recommended :

- (1) the establishment of a National College of Physical Education with a degree course of physical education, and
- (2) a miscellaneous scheme for the promotion of physical education and recreation.

the Government of India have set up a Committee of Medical Experts to evaluate the therapeutic claims of Yoga and make recommendations to the Government of India on the scientific development of the Institutions. Seminars on physical education and research and National Physical Efficiency drives are other facets of this activity.

Model syllabuses of physical education for boys and girls recommended in the National Plan of Physical Education and Recreation and Syllabuses of Health Education for the Educational Institutions and the Teachers' Training Institutions have also been prepared and the following means to popularise the syllabuses have been recommended :

- (a) Publication and large-scale distribution of the syllabuses to the educational institutions ;
- (b) Preparation of film strips ;
- (c) Preparation of illustrated hand-books on two syllabuses and
- (d) *Organising six-week regional courses for training teachers in the various activities included in the syllabuses.*

There are at present 31 Physical Education Training Institutions in the country providing facilities for teachers of Physical Education

(iii) National Discipline Scheme

A National Discipline Scheme is being implemented under Ministry of Education as a part of educational development programme during Second Five Year Plan. The main aim of National Discipline Scheme is to instil discipline into the Youth of the country to make them better citizens with high sense of responsibility, ideal of service and capacity to leadership and above all to imbibe in them a sense of unity and national pride. It aims at making the younger generation healthy—both in mind and body and instilling in them a sense of patriotism, self-reliance, tolerance and self-sacrifice. It inculcates amongst the children a spirit of nationalism and cultural unity.

The Scheme has a co-ordinated syllabus of theoretical and practical general knowledge and elements of administration and organisation are well balanced with a carefully chalked out programme of Physical Education comprising major, minor, recreational and indigenous games like kabadi, kho-kho, atya-patya, malkhamb, lezium, wrestling etc.

To bring out this idea of national unity and oneness inspite of *diversities of religions, customs and traditions selected items of traditional dances from all parts of India have been included in the Natio-*

nal Discipline Scheme syllabus. Besides having an immense educative value these provide a base for cultural unity.

(iv) Games and Sports

(i) The National Institute of Sports has been set up at Patiala with the primary object of producing first class coaches. Services of foreign instructors are to be availed of.

(ii) National Coaching Scheme.

(iii) Assistance to Sports Federations/Associations.

(iv) Construction of Stadia, with a 50% grant from the Centre.

(v) Assessment of work done so far

It may perhaps be pointed out that physical education suffers from certain peculiar handicaps and barriers which slow down the pace of development programme, howsoever ambitious it may be. Although we in India have accepted physical education as an integral part of our general educational set up it has yet to receive its due emphasis. While physical education is more or less compulsory in schools, it is to be feared that in many cases it is a perfunctory activity. Above all, among the general public of our country there is not enough appreciation of the contribution that physical education and sports can make to the balanced development of the child's personality. The educational system is still lopsided. There is a lingering prejudice that the time spent on physical education and sports is wasted and that they serve no useful purpose. Public opinion, therefore, needs to be influenced in this respect and a great deal of publicity is necessary.

What is most needed is a more wide-spread realisation on the part of all concerned of the fact that physical education which term includes Games and Sports also is an essential part of the education and no educational system or method can be called complete if Physical Education is not allowed to play therein its full role.

21. Quarantine :

(i) Recommendations of the Bhole Committee

The Bhole Committee observed that in regard to international quarantine, the measures enforced in India were considered reasonably complete and satisfactory. These measures related to prevention of export of infection in respect of diseases recognised under the International Sanitary Convention and protection of India from the possible introduction of diseases such as yellow fever, sleeping sickness from which this country was free. The committee suggested that the Central

Government should be given powers to compel a province to fall in line with other provinces in regard to ratification of international treaties and in regard to action in respect of health requirements of airports and surrounding areas.

In regard to internal quarantine, which involved the enforcement of measures designed to control the spread of infectious diseases between neighbouring units of administration, the Bhole Committee said that the Central Government should be responsible for the enforcement of all measures against inter-provincial spread of infectious diseases. The Central Government should also be empowered to have a say in the control of communicable diseases within the various provinces. A memorandum of instructions to be followed by Central and Provincial Health Departments for the control of infectious diseases should be prepared by the Central Government. An inter-provincial fund for carrying out the measures outlined above should be created. The participation of Indian States as they existed at that time (and which were excluded from the purview of the Bhole Committee) was also considered necessary in order to make internal quarantine really effective.

(ii) Present Position

The administration of the ports of Bombay and Calcutta was taken over by the Central Government in 1937, of Cochin and Visakhapatnam in 1938, Madras in 1939 and Kandla in 1956. These were all major ports. The administration of the minor ports is in the hands of State Governments. The quarantine administration at the international airports of Bombay, Calcutta, Madras, Pafam and Trichinopoly is in the hands of the Central Government and part-time health clearance arrangements are provided at other smaller airports. The Indian Aircrafts (Public Health) Rules, 1954 are based on the International Sanitary Regulations which were accepted by the Central Government with certain reservations. It may be mentioned that quarantine restrictions are not applicable to traffic between India and Nepal as a result of mutual agreements.

Increasing communication with yellow fever infected territories in Africa, faster sea and air traffic, favourable meteorological and other conditions for the growth and sustenance of *aedes aegypti* mosquitoes, and susceptibility of men, monkeys and mosquitoes to yellow fever infection, pose a constant threat to India from this disease. Special precautions are therefore taken to prevent its entry into India through aerial or maritime traffic. All aircrafts entering into India from the West are disinfected as a routine measure, if not already disinfected at Karachi Airport. All persons arriving within nine days of their de-

parture from yellow fever-infected areas without valid certificate of vaccination against yellow fever are brought to mosquito-proof isolation hospitals at international airports. Monkeys being prone to yellow fever infection are not permitted to be brought into India unless covered by a certificate. A plan of operation, in the event of yellow fever infection making its appearance in India, has been worked out and circulated to all concerned. Sufficient quantities of vaccine are kept in reserve. Provision also exists for the immediate despatch of a yellow fever diagnostic unit from Kasauli, Calcutta or Delhi to the infected locality. Yellow fever continues to be a notifiable disease in all States. Arrangements are being made for the manufacture of yellow fever vaccine at Kasauli. Other intensive anti-mosquito, anti-rodent and other sanitary measures are taken at all major ports and international airports. Water supply in ports and airports is subjected to periodical bacteriological tests. The sale of food stuffs and catering arrangements at ports are inspected periodically.

Increasing attention is now being paid to the medical care of seamen in close co-operation with the Ministry of Transport and Communication. Separate seamen clinics are in existence in Bombay and Calcutta.

It may also be mentioned that under the Constitution of India, inter-State spread of communicable diseases is a concurrent subject, which has enabled the Central Government to undertake legislation when an emergency arises.

22. Model Public Health Act :

The Bore Committee recommended that a consolidated Public Health Act for the Central and State Governments should be enacted, in order to bring together the existing legal provisions on public health scattered over various enactments, to modify such enactments as may require change in the interest of promoting efficient health administration and to incorporate new provisions which may found to be necessary to provide for the development of various forms of health activity. Legal provisions relating to health were found in about 40 different Acts at the Centre. In the States, similar provisions on the administration of public health were scattered over a number of enactments and the same multiplicity of such legal provisions impaired the administration of public health.

The Environmental Hygiene Committee which was set up by the Government of India in 1948 endorsed the recommendations of the Bore Committee in regard to the enactment of a Model Public Health Act.

The Central Council of Health in 1953 considered the question of a consolidated public health act and recommended that the Central Government should draw up a Model Public Health Act to serve as a guide for State legislation to be undertaken with such modifications as may be necessary to meet local conditions. The resolution of the Central Council of Health in this regard was accepted by the Government and a Model Public Health Act Committee was appointed. This Committee submitted a Draft Model Public Health Act in late October, 1955. The draft Act dealt with the organisational and administrative provisions, medical relief and public health measures, sanitation and certain general provisions relating to financial matters.

The Draft Act was circulated to State Governments for comments. They agreed that the draft was a comprehensive one and had taken note of recent advances in the principles and practice of public health administration, although certain States felt that the implementation of the Model Act would involve huge expenditure far beyond their capacity. The comments of the State Governments were again considered by the Central Council of Health in 1956 and they recommended that a draft bill on the basis of the model Act should be prepared by the Central Government and circulated to State Governments. In the process of drafting such a bill it was pointed out by the Ministry of Law that the draft Act would include within its scope a large number of subjects on which there was already a considerable amount of Central and State legislation and that it would involve the examination and consolidation of all the scattered Public Health Acts. The Law Ministry was of the opinion that the task involved would be so great as to be out of proportion to the results achieved. On the other hand, State Governments could with advantage undertake legislation on any of the topics mentioned in the draft Act and not already covered by existing legislation. It was therefore decided not to proceed with the drafting of the Model Public Health Bill and the State Governments were informed accordingly.

Incidentally, it may also be relevant to point out that the Estimates Committee in its report on the Health Ministry for 1958-59 reported that the position in regard to the enactment of a consolidated Public Health Act by State legislatures might be reviewed in view of the fact that adequate attention had not so far been paid in the States to the solution of their public health problems.

We have considered all these facts and have come to the conclusion that in the interest of public health all over the country, the time has come when every State should have a Public Health Act of its own. We also feel that there are certain essential subjects which

should be included in the State Public Health Act. We would recommend to the Central and the State Governments that the Model Public Health Act which we understand has been framed by the Ministry of Health, Government of India, may again be brought to the notice of all the States with the suggestion that they may in the light of changes in the constitution of the States, consider what further amendments should be included. The State Governments may also consider to what extent the Model Public Health Act should be revised in the light of the general recommendations and the general improvements that have taken place in other fields. It will be open to the States to add such provisions as they deem necessary in every sphere of public health but the necessity for passing a Public Health Act in the States, in our opinion, is fundamental and very urgent.

CHAPTER VII

COMMUNICABLE DISEASES

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While communicable diseases have either been eradicated or effectively controlled in many advanced countries, these still continue to be the major contributors to morbidity and mortality in India.

The Bhole Committee in Volume II of their report said that "while all forms of disease can be defined as departures from the harmonious functioning of the body owing to man's failure to adjust himself to the environment, the large group of illnesses resulting from parasitic invasion must be looked upon as a struggle for existence between man and the parasites which gain entry into his body..... The man and the parasite establish a form of armed neutrality between themselves. The man outwardly re-establishes his health but the parasite has not been completely destroyed When favourable conditions prevail the organism multiplies quickly and is excreted in the urine or faeces of the patient who, apart from the ill-effects on himself, thus becomes a potential source of infection to his fellowmen."

1. Bhole Committee's findings and Recommendations

That Committee, as the result of their survey, made the following observations in regard to legal and other aspects of Communicable Diseases.

(1) Local Self-Government Acts included provisions which conferred power on the local bodies for the control of infectious diseases. These powers, broadly speaking, related to the notification or reporting of cases of infectious diseases to the local health authority, the segregation and treatment of patients and the carrying out of other measures necessary for the prevention of spread of infection.

Municipal and Panchayat Acts, however, generally placed the responsibility of notifying the occurrence of communicable diseases on the householder, the medical practitioner including the Hakim or Vaidya, etc.

(2) The Epidemic Diseases Act of 1897 gave emergency powers to Governments — Central and Provincial — for the promulgation of temporary regulations to deal with the out-break of epidemics, which often occurred in the wake of melas, fairs and pilgrimages.

(3) In the rural areas except in the Province of Madras, the village chowkidar reported such cases to the police station who

forwarded the information to the local authority. This naturally involved delay.

(4) Isolation was an impossible task well nigh beyond the capacity of the local authorities concerned. In the circumstances the practice of isolation was practically non-existent. This was also due to the fact that the total number of infectious diseases hospital beds in the country, located mainly in cities and larger towns, was extremely small, in comparison with the requirements for segregation.

(5) Control measures which could be expected to be taken were necessarily of a limited nature because of insufficiency of health staff. Mass vaccination or inoculation, disinfection of infective material, etc., were carried out in a very perfunctory manner.

The main recommendations of the Committee in respect of the major communicable diseases were briefly as follows :

Malaria : Anti-malarial organisations should be established in provinces and the Malaria Institute of India should be strengthened. At the headquarters of each province there should be under the anti-malaria organisation a number of malaria control units manned by specially trained officers. The production of quinine and other anti-malarial drugs was recommended.

Tuberculosis : The incidence of the disease was believed to be higher in urban and industrial areas than in the rural areas although owing to migration of labour population between the industrial and rural areas and owing to improved transport facilities there was a tendency for tuberculosis to spread in the country-side also. For the control of spread of tuberculosis a comprehensive and integrated service including domiciliary service, clinics, hospitals, aftercare clinics, homes for incurables and ancillary service was suggested.

Smallpox : Primary vaccination should be made compulsory throughout the country without delay and State Governments should follow the example of the Government of Madras in making re-vaccination compulsory. The training of vaccinators should be of a uniform type and their recruitment and conditions of service should be improved. Vaccination against smallpox should be one of the normal functions of the public health inspectors, public health nurses and midwives employed in primary units. An intensive vaccination campaign against smallpox should be organised without delay.

Cholera : Permanent measures for its control included protected water supply, satisfactory disposal of night-soil and control over the production, distribution and sale of food. Temporary measures included isolation and treatment, disinfection of infective material and immunization.

Plague : Even though its incidence had been reduced considerably, certain endemic areas existed in different parts of the country and they constituted a constant threat. The measures against the disease should mainly be directed against rats, which should be systematically destroyed. Construction of rat-proof dwellings, rat-proof grain stores, control over the location of trades and industries which are likely to attract rats and a general improvement of the sanitary conditions in towns and villages were other recommendations of the Bhole Committee.

Leprosy : The Bhole Committee recommended that provincial leprosy organisations should be created, the provision for institutional treatment should be increased, isolation clinics should be developed ; voluntary organisations engaged in anti-leprosy work should be helped substantially with finances and a Central Leprosy Research Institute should be established.

Venereal Diseases : The provision of free and confidential treatment of affected persons, education to promote the growth of individual moral sense towards himself and the community, sex education, control of prostitution, etc. were the measures recommended.

Hookworm Disease : Was widely prevalent in India among the labour population of Assam, South India, etc. The measures against this disease should be adequate arrangements for disposal of night-soil and mass treatment. Health education was another important measure.

Filariasis : Extended research had failed to produce satisfactory cure for the disease and it was essential to adopt control measures to effectively reduce the mosquito population.

Guinea Worm Disease : The prevalence of the disease being dependant on opportunities for the infection of water supplies by persons harbouring the guinea worms, stop wells and tanks and other sources of water liable to contamination by such persons should be protected ; water supplies should be sterilised by the application of lime.

2. Some general considerations :

In the light of the reports received with regard to the progress of communicable disease control programmes, we wish to emphasise that the control of communicable diseases cannot be dealt with exclusively as a State subject. Control of communicable diseases must simultaneously be a Central responsibility besides that of the States. It is an unwise policy in the interest of the nation as a whole for the Centre to be expected to intervene only in the event of inter-State spread of infection. This would amount to the Central authority not stirring itself until considerable damage had been done. In dealing with the subject of communicable diseases we have necessarily to emphasise the fact that there are no borders, State or otherwise, in regard to the spread of communicable diseases from place to place. Programmes of eradication or control of communicable diseases cannot therefore be left entirely to the individual States and there has to be a simultaneous Central and inter-State co-ordination of action in the control of every form of communicable disease. Instances of lack of the necessary co-operation between neighbouring States in this matter are not unknown, particularly after the re-organisation of the States. We have in mind a recent case where on the outbreak of smallpox in a certain area the procurement of vaccine from a place almost next door but within the jurisdiction of another State not being permissible it took the best part of three days for the vaccine to arrive from the State's own depot situated at some considerable distance from the site of the epidemic. The fundamental necessity of taking immediate steps for the control of the outbreak thus had to be sacrificed to the preservation of certain administrative procedures. While this may be a temporary phase in the progress of development, we must emphasise the necessity of ending such restrictions, financial or otherwise, in the way of immediate action required for the control of communicable diseases.

In order to promote collaboration, co-operation and urgent action where necessary in regard to the control of communicable diseases, we suggest that in each zonal region there should be an organisational set-up representing the Central Government and the States of the zone concerned. With such an organisation may be associated two or three experts concerned with communicable diseases. We understand that six regional offices have been constituted in connection with the Malaria Eradication Programme and that these regional offices have functioned satisfactorily in maintaining the necessary liaison between the Central and the State Governments and in keeping up the necessary tempo of activity. Regional central offices are also believed to be functioning in the field of engineering and technology staffed and maintained by the Central Ministry concerned and performing co-ordinating activity in this

field in consultation with the States concerned. Such organisations could function not only as clearing houses for the transmission of information in regard to communicable diseases between one State and another and between the States and the Centre, but also as agencies for adoption of the necessary measures for the control of communicable diseases generally and for fighting epidemics particularly. These and many other functions in which close co-operation between the Centre and the States and inter-State collaboration are involved could be handled and promoted by the proposed regional organisations. We, therefore, strongly recommend the establishment and enlargement of such organisations.

We hold that health personnel, medical and non-medical, are exposed to unusual risk by contacts with patients suffering particularly from infectious diseases. We feel that some sort of compensation should be given to them in case they contract any disease. Whether the compensation be under the Workmen's Compensation Act or by a new legislation, it is a matter for the Government to consider.

3. Constitutional provisions in regard to Communicable Diseases :

The present position with regard to the constitutional aspects of the control of communicable diseases is as follows :

The Union List to the Seventh Schedule includes control of pilgrimages to places outside India, port quarantine including hospitals for seamen, measures for the control of the spread of diseases by aircraft, rail or sea going vessels and inter-State migration and inter-State quarantine. The Concurrent List includes measures for the welfare of lepers and for the prevention of extension of infectious diseases from one State to another. The State List places the primary responsibility of sanitation and public health including the control of communicable diseases on the constituent States. Water supply facilities, etc., are also the responsibility of the State Governments.

We have given considerable thought to the present status in regard to the constitutional delegation of responsibility between the Centre and the States in the matter of health subjects in general and communicable diseases in particular. While, as already indicated, we are of the view that the Central control in this matter should be much more pronounced than appears to have been the case, in recent years we consider that it is neither feasible nor necessary to secure this by recommending a change in the relevant constitutional provisions. We wish to point out however, that the subject of control of inter-State spread of diseases does figure at present in the concurrent list of the Seventh Schedule of the Constitution. The provisions of any central legislative

measures in this matter would thus be binding on the State Governments. It is our view, however, that the development of a national outlook through the processes of co-operation and discussion has much to commend it, in preference to the enforcement of action with statutory sanction. We trust, therefore, that the regional organisations suggested by us earlier will help towards the growth of healthy conventions calculated to promote the attainment of the common objectives of both the Central and State Governments.

4. Findings and Recommendations :

(1) GENERAL

Notification of communicable diseases : We note that the present condition with regard to the notification of communicable diseases is far from satisfactory and will perhaps continue to be so until the network of the health services is more evenly spread out and until the agency for the notification is streamlined. The Committee notes with regret that even the present limited legal obligations are not observed by general medical practitioners and others. Necessary measures to enforce them should be promoted. We see no reason, however, why in the meantime the network of the fairly extensive police wireless stations should not be used for the transmission of the necessary intelligence from the rural areas to the nearest district health organisation. The regional organisations we have discussed earlier should thereafter take over the responsibility for the relay of the information to the other States concerned.

There are certain other essential pre-requisites for the adequate control of communicable diseases to which we would like to refer here briefly.

Infectious Diseases Hospitals : The deplorable condition in which the large majority of infectious diseases hospitals, where they exist, are maintained is common knowledge. It is not to be wondered therefore that the notification of the outbreak of communicable diseases is suppressed. The attending physician in his dilemma between the duty to report and notify a disease and the knowledge of the conditions to which he would be consigning his patient not unoften chooses to give first place to the welfare of his patient. The improvement of the conditions of the infectious diseases hospitals, so as to make them fit institutions for the treatment of the sick and not merely as places of detention of persons dangerous to the community, is a prime need. Every municipality with a population of 50,000 should have a modern isolation hospital with facilities for the treatment of small-pox, cholera, diphtheria and plague

separately. In municipalities of a size smaller than this, isolation wards attached to general hospitals should serve the purpose. In bigger cities like Bombay, Calcutta, Madras, Delhi and Kanpur, it would be necessary to have not one but as many as three to six separate isolation hospitals suitably distributed in different parts of the Corporation area to serve the different zones. The hospitals should have an open area of at least 2 acres and should provide all facilities for treatment including surgical procedures. Provision should be made for the temporary expansion of these hospitals at short notice to cope with the emergency on the outbreak of epidemics. The practice of providing accommodation for infectious diseases cases in large barracks is to be strongly deprecated. The ward units should not exceed 10 beds at the most. Even smaller units with glass partitions separating each other to facilitate supervision would be preferable. Provision should also be made in the infectious diseases hospitals for the segregation of contacts for a short period for observation. A-type design of an infectious diseases hospital has been developed for use with such modification as may be considered necessary in the light of the local conditions. Apart from the infectious diseases hospital every general hospital including the maternity hospital should have a small isolation block for the purpose of observation of certain cases and for continuing without interruption such treatment as may not be possible in an infectious diseases hospital of a case developing communicable disease while under treatment in a general hospital. Every infectious diseases hospital should also have on call a surgeon whose services may be requisitioned when required.

We suggest that the type design of a 50 bedded infectious diseases hospital shown in Appendix C. 7 may be made use of in planning infectious diseases hospitals.

Public Health Laboratories: Public Health Laboratories equipped to undertake laboratory and field investigations must be considered the *sine qua non* in any communicable disease programme. A chain of such laboratories should spread from the central laboratory in each State through regional laboratories to laboratories at the district headquarters and the bigger municipalities. The regional laboratories could serve the needs of two or three districts or a population of 5 million and should be fully equipped to undertake diagnostic and analytical work including water and food analysis and serological and cultural procedures. Each such laboratory besides providing requisite physical facilities, equipment and personnel to handle the types of work mentioned above should also have (1) a mobile unit so as to be able to take up field investigations at short notice and (2) two or three additional rooms where any investigation unit specially deputed for this purpose from the headquarters could be accommodated without dislocating the normal work

of the laboratory. It is highly desirable that a blood bank should form part of such laboratory units. The Regional Laboratory should be so equipped as to be able to take up laboratory investigations not possible at the district laboratories and also to be able to supply to the district laboratories antigen and other reagents required for laboratory procedures.

We visualise that such laboratories will not only cater to the needs of public and other institutions but also place the facilities at the disposal of the medical practitioners free of charge for the examination of clinical material in connection with the diagnosis of infectious diseases, cholera, tuberculosis, cerebro-spinal meningitis and enteric fevers (Vidal's reaction). For laboratory investigations other than these a fee not exceeding the actual cost of the test may be levied from the practitioners. Such public health laboratories should be closely associated with and work in liaison with the epidemiological bureaux in the States.

A standard type design of the regional public health laboratories keeping in view the requirements stated above has been prepared and is attached. (Appendix C. 5.)

Immunisation Programme: A comprehensive and well organised immunisation programme for each individual member of the community is now recognised as one of the essential duties of the modern public health service. Immunisation against smallpox, tuberculosis, diphtheria, whooping cough and tetanus and lately poliomyelitis is a routine procedure now in almost all the western countries. Appendix B. 22 sets out the time table, doses, etc. recommended for this purpose by the S.E.A.R.O. of the World Health Organisation. We note with regret that the present position in regard to vaccination against smallpox leaves much to be desired but we hope that the smallpox eradication programme planned by the Government will improve the situation. We would like to caution, however, against the development of a sense of complacency on the termination of this drive. Unless this is followed up by a sustained programme of re-vaccination and primary vaccination of new born babies, the achievements of the eradication programme may be found to be illusory. The maintenance of vaccination at a satisfactory level will depend also on the improvement of the machinery for the reporting of vital statistics and also on the exercise of adequate supervision on the work of the vaccination staff, the standard of both of which is believed to be much below par as also on the potency of vaccine. We note that vaccination is laid down as one of the duties of the Panchayat Samitis and that this would be one of its main functions. B.C.G. vaccination and vaccination of the triple vaccine are also measures which need to be made a routine procedure in all cases. We have given considerable

thought to this matter and we are of the view that the present tendency towards multiplication of agencies for the achievement of these tasks must be strongly deprecated. Instead of putting into the field an independent unit for each separate type of activity such as for T.B., Malaria, Leprosy, etc. it is necessary that the normal health agencies in the field must be increasingly utilised for the immunisation programme. In order to give as broad a base as possible to the machinery for promoting immunisation we feel that it is necessary to make much larger use of the para-medical personnel under the supervision of qualified medical personnel. We also consider it necessary that the medical men outside the official health services should be pressed into service on an increasingly large scale not only for immunisation work but also in supplementing the health services in various other directions. These remarks apply as strongly to programmes of survey and treatment of special conditions as to immunisation. We suggest that in order to develop programmes on the lines indicated above it will be well for each State to carry out pilot studies in selected areas. In making the above suggestions we also have in mind the survey team operating separately for malaria, leprosy, tuberculosis, etc. The present teams used exclusively for such work as B.C.G. Vaccination and other immunisation programme, like smallpox etc. should be utilised for multipurpose immunisation and given necessary training and orientation wherever required. Except in the case of investigations of a highly scientific and precise nature we feel that such service could be undertaken by teams trained for the purpose.

Epidemiological Units : Each State should have a fully equipped mobile epidemiological unit which should be able to proceed at very short notice to any part of the State to take in hand the field and the laboratory investigations of the outbreak of an epidemic. Except in a few States such work is usually undertaken by ad-hoc teams got together as and when required. Investigation of the outbreaks of the epidemics requires skill, experience and the necessary facilities and cannot be carried out satisfactorily except through a team trained and equipped for this purpose. This, we feel, is a matter which cannot be left entirely to the State Governments in view of the nature of the problem and the possibilities of inter-State spread. While for small outbreaks of diseases, the nature of which can be clearly and quickly established, the State units may be adequate, occasions arise every now and then when either from the size of the epidemic or from the nature of manifestations, the State unit may not be able to grapple with the problem. It should therefore, be for the Centre to maintain a nucleus organisation, the services of which could be called upon by any State in an emergency of the nature mentioned above where outside assistance may be necessary. At periods other than those of epidemics, such a team could be usefully

occupied in surveys and such other studies. It is understood that facilities of this kind are available with the Defence Medical Services. We suggest that necessary arrangements be negotiated with the Armed Forces Medical Services with the object of making use of this unit in any part of the country where it may be required for investigation/treatment of the outbreak of any communicable disease.

In the following paragraphs we state our assessment of the position in regard to major communicable diseases as also our recommendations in regard to some of them such as malaria, filariasis, tuberculosis, leprosy, smallpox, cholera, plague, venereal diseases, and virus diseases. A brief mention is also made of radiation hazards.

(2) MALARIA

Malaria has always been the most important public health problem in India. The Bhole Committee recommended the creation of anti-malaria organisations at the Centre as well as in the States with a number of malaria control units. Prior to 1953, malaria control operations were being carried out in some of the States in certain areas covering a population of about 30 million at a cost of approximately Rs. 1.5 crores. The Planning Commission endorsed the recommendations of the Health Survey and Development Committee and recommended a nation-wide Malaria Control Programme through a Central Organisation in co-operation with the States. As a result the National Malaria Control Programme was inaugurated in 1953 with the object of reducing malaria morbidity in the highly malarious areas of the country to such a low level, that the disease would cease to be a major health problem. The Control Programme envisaged that measures should be continued subsequently to ensure that the low level of malaria incidence and morbidity was maintained. By the end of 1957-58, 193.5 units (each designed to cover one million population) out of 200 units allotted to various States were in operation. The total population covered during 1957-58 was in the region of 165 million. Upto the end of 1957-58, 23.17 crores of rupees were spent on the National Malaria Control Programme.

During the year 1958-59, the National Malaria Control Programme was changed over to a nation-wide Malaria Eradication Programme taking into consideration the possibility of complete eradication of the disease as demonstrated in some other countries and the possible risk of the development of resistance to insecticides in malaria-carrying mosquitoes in a long continued control programme, as originally envisaged in the N.M.C.P. It was also considered that malaria eradication programme would be more economical, being a time schedule programme,

as compared to the indefinitely continuing control programme in the country. The National Malaria Eradication Programme commenced from April 1958, the 3rd year of the Second Five Year Plan,

The objective of the National Malaria Eradication Programme is to protect the total population of the country residing in malarious areas irrespective of the degree of malariousness and finally eradicate the disease from the country within a phased time period. The cost of the Eradication Programme (inaugurated in 1958-59) during the last three years of the Second Plan period was estimated at Rs. 43.57 crores out of which the States were to spend Rs. 15.19 crores, the Centre Rs. 10.09 crores and the balance of Rs. 18.29 crores (equivalent to 38.4 million dollars) in foreign exchange was to be made available by foreign agencies mainly by the USTCM and partly by World Health Organisation.

Under the National Malaria Eradication Programme 230 hyper-meso endemic units (in highly malarious areas) and 160 hypoendemic units, each unit designed to cover a population of one million, were formed. All the units carry out residual insecticidal spraying in each and every roofed structure in the areas lying within the ambit of their operations. During 1960-61 besides spraying operations in 390 units, surveillance operations were to be instituted in 365 units. The object of surveillance procedures is malaria case detection by house to house visits, treatment of the microscopically positive cases, their epidemiological investigation and further preventive measures as may be necessary. Surveillance operations are not proposed to be started in the remaining 25 units designated "border and problem area units", which will continue spraying without surveillance operations till 1964-65. Twenty of these units are situated on the border of the neighbouring countries i.e. West Pakistan, Nepal, East Pakistan and Burma, where spraying is to be continued till 1964-65, to prevent introduction of infection from these countries. Five units (problem area units) will similarly continue spraying where there is likelihood of continued transmission due to difficulties in communication, scattered population and other epidemiological factors. Most of these problem area units are situated in tribal areas with scattered population in difficult terrain.

A sum of Rs. 55 crores has been allocated for malaria eradication in the Third Five Year Plan. During the Third Plan period there will be a phased programme of withdrawal of spraying from units that fulfil certain criteria, where surveillance operations will continue according to the Plan.

Supplies — Material and Equipment

Each unit is supplied with :

(1) Insecticides equivalent to DDT 75%, 45 tons per round.

(2) Trucks 4 100

(3) Jeep 1 v

(4) Stirrup pumps 54 for plan area units
72 for difficult area units

(5) Compression
sprayers 108 for plan area units
144 for difficult area units

(6) Anti-malarial drugs

The supplies of insecticides at the rate of 28.5 tons per round at the beginning of the National Malaria Control Programme was later on increased to 35.5 tons per round. As further supply of insecticide was necessary and required by many States, this has since been raised to 45 tons per round from 1960-61 which provides approximately 27% increase over the previous quota. Similarly, on account of augmentation of spraying staff from 1959-60, 300 trucks have been supplied in 1959-60 as additional reinforcement transport. 150 jeeps were expected to be supplied as additional reinforcement transport in 1960-61. Similarly, it is proposed to supply another 80 jeeps and 100 trucks in 1961-62.

Besides the headquarters organisation of the Director, National Malaria Eradication Programme, six regional co-ordinating organisations with headquarters at Delhi, Baroda, Coonoor, Cuttack, Hyderabad and Shillong have been established for co-ordination and liaison between the States and the Centre and continuous appraisal and assessment of results.

According to the approved pattern each N.M.E.P. unit in the States is to be under the care of the Medical Officer, with other ancillary technical and administrative staff. When the National Malaria Control Programme was changed over to National Malaria Eradication Programme, the Government of India recommended augmentation of the supervisory staff at the State headquarters, as well as creation of zonal officers to look after 5 to 10 units. This was necessary in view of the greater supervision and co-ordination essential for an eradication programme.

Training

301 officers, 1,473 malaria inspectors and 658 laboratory technicians (microscopists) have been trained at the Malaria Institute of India and the Regional and the State Training Centres. For the surveillance operations 94 officers comprising State Malariologists, Zonal Officers and Entomologists at the State headquarters and the Regional Officers were given training in orientation courses on surveillance procedures, conducted by the Malaria Institute of India in Mysore. Those officers in their turn are training the Unit Officers, who in their turn will give necessary training to the Surveillance Inspectors and Surveillance Workers.

Spraying Operations

(a) The overall first and second round coverage in endemic units in 14 major States during 1958-59 and 1959-60 is shown below :

	1st Round		2nd Round	
	Overall (Per cent)	Range (Per cent)	Overall (Per cent)	Range (Per cent)
1958-59	87	68.6 to 96.6	74.3	52.1 to 92.3
1959-60	85	36.2 to 95.2	82.0	49.5 to 96.7

(b) In the five Centrally administered territories and the Coal-fields Organisation, the coverage was as follows :

	1st Round		2nd Round	
	Overall (Per cent)	Range (Per cent)	Overall (Per cent)	Range (Per cent)
1958-59	94.5	90.7 to 99.7	66.1	14.7 to 95.8
1959-60	89.9	64.1 to 100	89.5	71.2 to 99.6

(c) The overall coverage during the single round in hypoendemic unit areas in 1959-60 was 91.7 with a range varying from 82.3 to 98 per cent.

Proportional Case rate :

(Percentage of clinical malaria cases to all diseases treated in hospitals and dispensaries.)

The rate was observed to be 10.8 per cent in 1953-54 at the commencement of the National Malaria Control Programme. During 1958-59, when the National Malaria Control Programme was switched

over to National Malaria Eradication Programme, it had been reduced to 4.0 per cent. Further reduction has been observed in 1959-60 and the rate was 2.4 per cent. Thus there would appear to be an overall reduction in 1959-60 by 40 per cent as compared to 1958-59 and 78 per cent against 1953-54.

Epidemiological evaluation

This consists of child spleen and parasite rates and infant parasite rates from different units in the country on which the results of the spray operations are mainly evaluated. This is dependent on the assessment of the data collected by the surveillance organisation. There has been a considerable fall in all these indices as given below :

	Child spleen rate	Child parasite rate	Infant parasite rate
1953-54	15.7%	3.9%	1.6%
1958-59	3.2%	0.5%	0.2%
1959-60	1.4%	0.2%	0.1%

Besides the epidemiological surveys carried out in the index (fixed) areas, independent epidemiological appraisals are also carried out by the State, Regional and N.M.E.P. Headquarters' staff in non-index areas randomly selected. The data from the index as well as non-index areas indicated that although the endemicity in the major tracts of the country has been reduced as a whole and malaria has more or less ceased to be a widespread problem, there are still foci of higher endemicity in some pockets scattered all over the country. A T.C.M. evaluation team after a 2 month survey of the anti-malaria operations in September-November, 1960 made a report, the main points of which are summarised below :

The impressions of the team on the whole were very favourable. It was felt by them that the benefits of residual insecticidal coverage can be more fully exploited by meticulous attention to details of spraying operations, and by personal inspection by senior and junior unit officers of the spraying work in all houses. These officers should necessarily have a spirit of dedication in order to carry out such thorough inspections; otherwise the coverage of houses of villages is bound to be superficial. The senior personnel should even intervene directly at the village level and get over the difficulties of locked houses or unwilling house-holders refusing permission for spraying operations. The field staff working in difficult terrains should be augmented where necessary to the extent of 50 to 100% in order to achieve total coverage. Alternative-

ly limited extension of the spraying operational period may be necessary in some units. It has been observed that the undersurfaces of beds, fixed sleeping platforms, tables and shelves which are favourable resting places of insects are not always being sprayed. The team has recommended a review of the probable benefits of such spraying especially in areas where the surveillance units have doubts about the interruption of transmission. *Epidemiological information should be collected by the examination of blood smears of all fever cases encountered in hospitals, dispensaries and Primary Health Centres and the malaria service should immediately examine slides and furnish results. Immediate initiation of complete active surveillance coverage by States is necessary, otherwise the programme is bound to get delayed. The studies confirming resistance of bed-bug nuisance forms one of the important reasons for house-holders refusing to allow spraying operations. The future of the Malaria Eradication Programme is dependant entirely on the ability of the individual spraymen and the individual surveillance workers. The national responsibility for the programme can be more firmly exercised if operational and epidemiological reports were received by the Centre on a monthly instead of annual basis. A unified command and a near-military precision in operations is necessary for the successful execution of the programme. There should be frequent exchange of views and discussions of problems between the Centre and the States.*

In regard to spraying operations, the team has observed lack of refinements desirable in a Malaria Eradication Programme and lack of engineering personnel to see that precision in large-scale operations like the present scheme is achieved effectively and that qualitative and quantitative intensification of field supervision is carried out.

Mud-washing and lime-washing neutralize the deposits on sprayed walls. Construction of new houses and re-thatching of old houses also result in incomplete protection. Non-treatment of newly constructed houses in labour camps associated with hydro-electric and other highway projects constitutes another weak link.

Three conventional indices viz., spleen rate, child parasite rate and infant parasite rate, adopted during the national malaria control programme, have now become practically useless. The time-of-the unit malaria officer-concerned in this profitless

activity could be more profitably used on the surveillance activities. The dispensaries, hospitals and other outdoor services should be utilized as a huge filter screen of fever cases, thus effectively complementing active surveillance in various areas.

It is too early to assess the feasibility and adequacy of the active surveillance programmes. The delays and excuses for not achieving total coverage have been appalling. Supervision must be tightened up and the procedure of submission of data in regard to active and passive surveillance should be revised.

One of the most compelling arguments for immediate eradication of malaria is the evidence that resistance to residual insecticides is occurring in various species of malaria transmitting mosquitoes. The most serious and anopheline resistance threat is not represented by the *A. Culicifacies* situation in mid-western India. *Anopheles fluviatilis* showed no resistance to D.D.T. *A. stephensi* larvae from Madras were found to be resistant to D.D.T. but susceptible to dieldrin. *A. annularis* was susceptible to both D.D.T. and dieldrin, in Rajasthan. *Anopheles subpictus* from several States have shown resistance to D.D.T. and/or dieldrin, but this species apparently plays no role in malaria transmission.

In the opinion of the team the routine anopheline collection, as practised in the field at present, is likely to encourage a dangerous complacency on the part of the units. Intensive efforts to house-capture anopheline are of obvious value, as part of exhaustive investigation of malaria cases, but routine searches in small percentage of the house of a unit have debatable assessment value.

Considerable research of bed-bug resistance has been carried out in Maharashtra. The resistance problem has been studied in Maharashtra where diazinone is being used against this pest. The gravity of the resistance problem and the fact that diazinone is toxic to spraying personnel emphasizes the desirability of immediate and more intensive investigation to discover more practicable insecticidal measures against this pest. Similarly the residual spraying programme causes heavy mortality on silkworms. Investigations carried out in Mysore indicated that larvae cannot be successfully reared in rooms treated some months before with residual insecticides, but this is contrary to the experience in Taiwan where it was found

that while spraying in villages could not be carried out when worms were actually present, silkworms were successfully cultured in rooms sprayed some months or weeks prior to the hatching of the eggs, so long as the larvae and food plants were not brought into direct contact with the insecticide deposits.

Inter-country Co-ordination for Malarial Eradication

As has already been indicated 20 border area units will continue to spray till 1964-65 to prevent re-introduction of infection from adjoining countries. To facilitate co-ordinated action with the adjoining countries, Indo-Burma Border Anti-malaria Co-ordination Conferences are held regularly and the last meeting was held in November 1959, in Aijal (Lusai Hills, Assam). A similar meeting between India and Nepal is proposed to be held in the near future.

Susceptibility status of malaria carriers (vectors)

As a part of entomological investigations in the National Malaria Eradication Programme, tests for the susceptibility status of the local malaria carriers (vector mosquitoes) are undertaken in different parts of the country by the State and Central Organisations as well as by World Health Organisation team working in Baroda area. The results show that recently there have been signs of lower susceptibility to D.D.T. indicating the possibility of resistance in some pockets mainly in Gujarat State. This lower resistance in the vector mosquitoes has so far not affected the malaria eradication, as the malaria transmission is still under control, but the situation needs a careful watch.

While we hope that the Malaria Eradication Programme undertaken by the Government of India will achieve the targets in the course of the 4th Plan period if not in the Third, we would like to draw attention to some of the problems likely to crop up as the result of a mass campaign of this size involving the use of insecticides on a nation-wide scale. Firstly there is the question of the possible development of resistance in the mosquito and the need for the completion of the Programme before this becomes manifest on a wide scale. There would appear to be certain calculated risks which have to be taken in the course of a programme of the dimensions of the Malaria Eradication Programme. One of these is that of insects other than malaria vectors becoming resistant to the insecticide in use. For instance the flea vector of plague is already known to have become resistant in many areas of the country which were endemic to plague at one time. Recently there have been a few human cases of plague reported after a lapse of 10 to 15 years. The next problem is that of kala-azar, transmitted by sand flies. There is need

to consider the possible resurgence of these diseases at the end of the attack phase of the Malaria Eradication Programme. The sand flies exist at present in reduced numbers and kala-azar patients are also there in the country (in reduced numbers as compared to the number prior to the commencement of the Malaria Control/Eradication Programme). With the withdrawal of the nation-wide insecticide spraying in the next two to three years kala-azar cases could be expected to occur in large numbers even giving rise to epidemic manifestations in certain areas. Unfortunately some of the State Public Health Directorates have in the last 10 years closed down the anti-kala-azar organisations that were in existence.

The present situation warrants a careful consideration of the use of insecticides to control insect-borne diseases of man and his animals and also against agricultural pests. Emphasis should be laid on the accepted methods of environmental sanitation and other suitable procedures. Co-ordination of the activities of the Ministries of Food and Agriculture and of Health in the matter of the use of insecticides on a large scale is very essential. Vigilance would also be necessary as the Malaria Eradication Programme comes to its terminal phases, to be on the look out for the reappearance of diseases some of which have been mentioned above. The sense of complacency which has developed in respect of these, as the result of the side effects of the Malaria Eradication Programme, may otherwise find public health services unprepared for sudden outbreaks of some of these diseases. It may aptly be said in this connection that "we need not mortgage the health of our future generations in our attempt to pay our present debts."

(3) FILARIASIS

While it was recognised that filariasis was responsible for much morbidity among the people living in certain endemic areas in the country, no concerted efforts were made in the past for its control. Most of the work done previously was in the nature of random sample surveys carried out under the auspices of the old Indian Research Fund Association or of the State Governments concerned. The Health Survey and Development Committee, after reviewing the general position, had suggested that "the only effective measures against the disease are those which are concerned with the control of the carrier species of the mosquito". It was further recommended that "the organisation suggested for carrying out the anti-mosquito measures for the control of malaria should direct its attention, in the endemic centres of filariasis, to the carriers of this disease also and should attempt to secure an effective reduction in the types of mosquitoes responsible for the disease".

The subject was further reviewed by the Malaria Institute of India which had drawn pointed attention to filariasis being a public health problem. It was noted that the infection was widely distributed in India, the only States probably free from indigenous infection being the States of Himachal Pradesh, the Punjab, Jammu and Kashmir and Rajasthan. It was then estimated that about 25 million people were living in known filarious areas in India.

In 1950, the Indian Council of Medical Research initiated a programme for developing methods for the control of filariasis by the utilisation of synthetic insecticides for dealing with the mosquitoes responsible for the transmission of infection and also the use of diethylcarbamazine recently introduced for the treatment of the disease. The object of the programme was to break the transmission cycle at some point which is essential in the ultimate eradication of the disease. Accordingly, a pilot project was established in the State of Orissa to evaluate separately the suitability of each of the following methods in the control of the disease :

- (1) Mass drug administration in suitable dosage of diethylcarbamazine in order to reduce the quantum of infection in any affected individual,
- (2) Anti-larval measures, and
- (3) Anti-adult measures by the use of DDT according to the programme followed in malaria control.

The pilot project lasted for a period of 5 years, at the end of which it was concluded that, while all the three methods of control were effective to some extent, each one of them had its drawback and that a multiple approach using all the three methods was essential for the control of filariasis in endemic areas.

Based on these objectives, the Government of India initiated in 1955 a country-wide programme called the National Filaria Control Programme for dealing with this disease in the major endemic foci in the country in co-operation with the Technical Co-operation Mission. The objectives of the programme were :—

- (a) to carry out filariasis surveys in different States where the problem was known to exist in order to determine the extent of prevalence, types of infection and their vectors,
- (b) to undertake large-scale pilot studies to evaluate the methods of filariasis control based on the experience of the pilot project in the Orissa State, and
- (c) to train professional and ancillary personnel required for the purpose.

With these objectives in view, Filaria Survey Units were established in certain States in order to assess the extent of the problem and Control Units to assess the efficacy of various control measures, namely, drug administration, anti-larval measures, anti-mosquito measures, etc. Survey and control units were established in different States as shown in the table below :—

TABLE No. 1.

State	Survey Units	Control Units *
Andhra Pradesh	3	2
Assam	—	1
Bihar	2	8
Gujarat	1	3.5
Kerala	2	6.6
Madhya Pradesh	2	1
Madras	2	4
Maharashtra	—	4.5
Mysore	—	1
Orissa	4	5
Uttar Pradesh	3	8
West Bengal	—	1
Andaman and Laccadives Islands	—	0.4
Pondicherry	—	1
Total	19	47

* N.B.: Each Control Unit was for a population of 300,000. Allotment was, therefore, made according to population covered.

The programme was in operation for five years. In 1960, the Government of India asked the Indian Council of Medical Research to appoint a Committee to evaluate the work done under the aegis of this programme and to suggest measures for future development. The Committee submitted its report to the Government towards the middle of 1961. The Committee's findings may now be briefly summarized.

Extent of the Problem : The work carried out by the Survey and Control Units working under the National Filaria Control Programme has served to define the problem of filariasis in a more realistic manner than before. In addition to the known endemic foci of the disease, it would appear that filariasis transmission is occurring in many areas in different States in the country where it did not exist before. It must be emphasised that there are many silent carriers of infection in the community who do not show obvious signs of the disease. These signs appear at a much later date in the evolution of the disease process. There is no doubt, however, that the disease rate and the infection rate have definite relation to each other. Based on these considerations, the filariasis problem in India can be defined as follows :—

- (1) Areas where the disease rate is very high, indicating that the transmission is of a very long duration, perhaps a century or more.
- (2) Areas where the disease rate is of the order of 10 per cent and the infection rate is 6 per cent or more. Local information available in these areas shows that the transmission has been perhaps occurring in such areas for the last 25 to 40 years approximately.
- (3) Areas where the infection rate is about 10 per cent, and the disease rate is almost negligible indicating that the transmission is only of recent origin, about a decade or so.
- (4) Areas where the infection rate is between 5 and 10 per cent, but disease rate is nil indicating that the transmission is less than 10 years old.
- (5) Areas where the microfilaria rate is less than 5 per cent with low infection and infectivity rates in local mosquitoes, indicating that the transmission has probably commenced within the last 2 or 3 years.
- (6) Areas where the *Culex fatigans* density is comparatively high with no infection or infectivity in them, can be classified as areas with a potential risk to filariasis transmission, and
- (7) Areas where the *Culex fatigans* density is low and infection and infectivity rates are nil can be classified as those without risk of filariasis.

It would now appear that over 64 million people live in the endemic areas of filariasis in the country. In addition to the known endemic foci of the disease, filariasis transmission is also found to be occurring in many areas in different States in the country where it did not exist before. Apparently, migration of people from the endemic zones to the new areas has been responsible for this state of affairs. The surveys have indicated, as has been stated earlier, that in addition to areas previously known to be filarial, there are other areas where the transmission has been going on for the last 10 years or so and where the disease has been introduced within recent years only. The information is, however, incomplete as there are many areas which are yet to be surveyed for the delimitation of the disease.

However, the significance of these findings is obvious. While attempts are being made to deal with the areas of high endemicity, it would be necessary to see that spread of infection to other areas is avoided. While attention has necessarily to be paid to areas of high endemicity of the disease, it would be equally essential to stamp out infection from recently affected areas, so that they do not develop into full-fledged foci of infection in due course. These aspects have to be taken into consideration in determining priorities where interim measures for the control of the disease have to be taken.

The Assessment Committee has recorded some interesting findings. It is noted that the spread of bancroftian filariasis is centrifugal i.e. from urban to the rural areas. This observation is important because with the expansion of existing urban centres consequent on the migration of population, as stated earlier, there is a large risk of filarial transmission being established in new centres. Administration of diethylcarbamazine on a large scale has apparently its limitations. It was found to be difficult to enlist the co-operation of the population to take the drug as scheduled in most areas. The total coverage of the population varied considerably. It was as low as 38.3 per cent of the population in some areas. Only in the case of one single Unit was a coverage of 93.6 per cent obtained. It was also noted that from 7.3 to 37 per cent of the individuals who took the drug showed reactions. Though these reactions were usually minor and transitory in a majority of cases, they were met with in a sufficiently large number to make the measure unpopular.

Experience during the last five years showed that none of the synthetic insecticides so far available is capable of significantly reducing the mosquito population to have resulted in the interception of filariasis transmission. On the other hand, anti-larval measures, wherever they have been tried adequately, have given encouraging results.

In view of the experience gained through the operation of the National Filariasis Control Programme in different States during the last five years, the Committee has made certain important recommendations for the control of this disease for implementation in the Third and successive Plan periods. These are summarised below :—

- (1) In view of the spread of filariasis from urban to rural areas, it is essential to concentrate control measures in the first instance in the urban centres.
- (2) The structure and functions of the existing control units should be so modified as to permit them to undertake effective anti-larval measures in such areas, continuously throughout the year.
- (3) Filariasis clinics should be established in suitable hospitals in areas where the disease is endemic.
- (4) In the epidemiological bureaus to be created in each State, there should be a separate section for filariasis in charge of an Officer of the status of Assistant Director of Public Health, whose function would be to work in close co-operation with the Public Health Engineering Section of the State and to assess the results of the control programmes from time to time.
- (5) Health education on the problem of filariasis should be an integral part of the activity of the Health Education Bureau of the concerned State.
- (6) Since the organisational pattern for the control of rural filariasis is yet to be evolved, it is essential to treat this as a research project and at least one research-cum-training unit should be established in each State where filariasis is a major problem.

We are in general agreement with the recommendations of the Assessment Committee. We wish to emphasise that in view of certain special features of this disease, like the presence of symptomless carriers in the community, long intervals between infection and manifestation of

symptoms, etc., control of filariasis is not amenable to a crash eradication programme adopted in the control of malaria. The effort will have to be continued for an appreciable time with adequate financial support before any tangible results can be obtained.

We have drawn attention in another place to the detection of filarial infection in places previously believed to be free of it. One of the major factors in this is the worsening drainage situation in urban areas where water supply facilities are being extended without simultaneous facilities of drainage and sewerage. While anti-larval measures may be expected to stem the tide temporarily, only adequate drainage facilities can provide a long term solution of the problem.

(4) TUBERCULOSIS

Tuberculosis in India began to pose itself as a problem in the early years of this century. Paucity of reliable statistics was a handicap in planning tuberculosis control measures. It was only during the last few years that it was possible to get a fairly reliable picture due to extensive tuberculin testings done in different parts of India, in association with the Mass B.C.G. Campaign, and isolated X-ray surveys conducted by T.B. workers in different areas.

Early efforts to fight TB in India were confined to providing treatment or isolation facilities for individual patients and this was largely provided by philanthropic bodies and Christian Missions in hospitals and sanatoria situated usually away in the countryside or in hill stations. The treatment usually was regulated life under open-air conditions and in later years supplemented by artificial pneumothorax and thoracoplasty operations. No effective drugs were available then.

Tuberculosis Association of India :

The first concentrated anti-tuberculosis effort on a nation-wide scale was the organisation of King George V Thanks Giving (Anti-Tuberculosis) Fund in 1929, later merged with King Emperor's Anti-Tuberculosis Fund which formed the Tuberculosis Association of India in 1939. This Association has branches in all the States. The Association's objectives are to mould public opinion in favour of anti-tuberculosis work, to act as a co-ordinating agency to provide a forum for discussion for T.B. workers all over India as well as to give expert advice on T.B. matters. From 1948 the Association has a Standing Committee consisting of prominent TB workers in India mainly to recommend and review TB schemes. It has organised the TB Seal's Sale Campaign which is an annual feature. It publishes the Indian Journal of Tuberculosis. Its conferences, publications and other activities have contributed a good deal to educate the public on TB matters.

Bhore Committee's Recommendations :

The recommendations of this Committee were based on the data available then and were in line with anti-tuberculosis measures carried out in western countries with certain modifications to suit Indian conditions.

The Committee estimated the requirements of about 1.5 million beds as against 6,000 beds then available. They therefore suggested the approach to the problem through isolation and treatment as it was impossible to provide this number of beds within any reasonable length of time. The Committee placed an organised domiciliary service in the forefront of the tuberculosis programme, although such a service was beset with difficulties.

They also recommended provision of a clinic for each district, expansion of domiciliary service and use of mobile clinics for the rural areas.

Other recommendations were the formation of After-Care colonies, training of TB workers and encouraging non-official and welfare organizations by Government to take increasing part in anti-tuberculosis work such as providing homes for incurables, etc. One of the recommendations was the creation of a special section for tuberculosis in the Directorate General of Health Services with an expert staff to advise and co-ordinate anti-tuberculosis work in the country as a whole.

Position at the Time of Independence :

The events that followed independence made the tuberculosis problem even more serious and difficult than what was visualized by the Bhore Committee. There was the problem of refugees as well as that of malnutrition. All these contributed to the worsening of the already serious tuberculosis problem. One of the first steps taken by the National Government to implement the Bhore Committee's recommendation with regard to TB schemes was the creation of a separate Section for TB in the Directorate General of Health Services, with a senior officer as Adviser.

National Plans :

The main items in this programme were (1) nation-wide introduction of BCG vaccination, (2) establishment of clinics and expansion of domiciliary service (3) establishment of at least one TB Training and Demonstration Centre in each State, (4) Provision of beds for isolation of TB patients, (5) rehabilitation centres and (6) Research. These were

later accepted by the Central Council of Health which recommended that these schemes should be subsidised by the Central Government.

Achievements :

The achievements during the I and II Five Year Plans are summarised below :

(1) **BCG Vaccination :** B.C.G. vaccination was introduced on a pilot basis in 1948 in Madanapalle and at the same time a B.C.G. laboratory was set up by the Government of India at Guindy to produce the vaccine necessary for the campaign. UNICEF and WHO help was secured and a programme for mass vaccination was gradually developed. The B.C.G. laboratory was expanded later for preparation of "freeze-dried" vaccine also. Some freeze-dried vaccine was prepared towards the end of II Five Year Plan period and at present this is being used for field trials in selected groups of population in different parts of India. If these trials are satisfactory, it is planned to use this vaccine more widely, especially in outlying areas where transportation of wet vaccine during the short period of its potency is not possible. At present the mass B.C.G. campaign in India is one of the biggest national public health campaigns in any country ; about 167 million persons had been tuberculin tested and about 57 million vaccinated by the end of 1960, by about 170 teams working in the various States. The administrative machinery for the control and supervision of tuberculosis, with the object of emphasising the public health aspects of this programme has been strengthened in many of the States, with the help of Central subsidies given for this purpose in the II Plan. Assistant Directors of Public Health entrusted with TB Control programme have been appointed under this scheme.

Clinics and Expansion of Domiciliary Services :

The second important item was the establishment of clinics and expansion of domiciliary services. Priority was given to this item because it was one of the practical methods which could be introduced fairly quickly and a good deal of work connected with the clinics could be carried out by trained technicians under the supervision of medical personnel. It was thought that it was not feasible to provide the beds in hospitals and sanatoria as visualized in the Bhole Committee's report. Another important reason for advocating clinics and domiciliary service was the discovery of effective anti-bacterial drugs for the treatment of T.B. and the possibility of their use in domiciliary treatment.

In 1947, there were about 85 clinics in India. During the First Plan period 55 more were added. However, most of the clinics were

not doing effectively the work expected of them. A majority of them did not have diagnostic facilities, such as X-ray and laboratory, nor did they have adequate staff of doctors, health visitors and other ancillary personnel to carry out the services. A scheme for the upgrading of 100 existing T.B. clinics and for the setting up of 200 new clinics so as to provide one T.B. clinic in each district was initiated in the Second Plan. The Central Government was to provide the X-ray and laboratory equipment and the States the necessary buildings, staff etc. Plans for only sixty such clinics actually materialised although even this number is not understood to have actually started functioning.

Demonstration and Training Centres :

Three centres — one each in Delhi, Patna and Trivandrum — were established even before the I Plan period. One in Nagpur, one in Madras and one in Hyderabad were established during the II Plan period. One is being established in Bangalore now and two more are planned, one at Agra and one at Calcutta, in the near future.

National Tuberculosis Institute :

While the responsibility for training the majority of workers needed for the implementation of tuberculosis schemes in the country will be that of demonstration and training centres in the various States, the National Tuberculosis Institute recently set up in Bangalore is intended to inculcate in Tuberculosis workers in different centres, a new vision and a new outlook to enable them to accept the community service as the important normal procedure in tuberculosis control rather than clinical work and running of tuberculosis hospitals and institutions.

This Institute will primarily be engaged in training the senior staff who are to man the various Tuberculosis Centres in the country and also those who are to direct anti-tuberculosis work in the States. The trainees will include doctors, home visitors, laboratory and X-ray technicians, health educators, social workers, statistical assistants and BCG workers. It will concentrate on training of doctors who are to be in charge of tuberculosis clinics and senior public health nurses who are to supervise the home visiting services of these clinics. It will also train laboratory and X-ray technicians and B.C.G. workers especially needed for the type of work in a tuberculosis clinic.

Provision of isolation beds was made in the National Plan as it was felt that there were many patients living in crowded homes under unhygienic conditions, especially in cities, needing isolation and hospital care. During the I Plan, the target was to provide ten thousand beds but the achievement was less than five thousand and these were mainly added to the existing sanatoria and not generally provided for patients

living in crowded areas. In the II Plan, provision for four thousand beds was made but only about 2,500 were established.

Rehabilitation and Aftercare Centres :

These colonies were needed at a time when treatment of patients had to be undertaken in institutions for long periods and when patients were not able to come back to normal health without having a safe period of rehabilitation under strict medical supervision. Since a large number of patients can now be treated in their homes with the new drugs, without interfering with their normal work, the problem of rehabilitation is not so acute or large as it was in the past. Therefore, the scheme for rehabilitation is limited to a comparatively small number who cannot find employment. There are ex-patients colonies of the old type—one each in Madanapalle, Madras and Bangalore and one in West Bengal. A new type of work centre is being developed in the New Delhi T.B. Centre as a *prototype of Centres to be developed in future in other places also.*

Research :

Another important item included in the National Plan is Research in Tuberculosis. A certain amount of research had been done even before the Five Year Plan Schemes were formulated in a few institutions, especially to find out the efficacy of some drugs.

A research scheme initiated during the First Plan period was the one relating to community Tuberculosis control programme. This was established in Madanapalle. This investigation which was started in 1948-49 by the U.M.T. Sanatorium as part of its community programme, was later continued on an expanded scale with the assistance of World Health Organisation and the Government of India. Here methods of Tuberculosis control included isolation of infected cases and BCG vaccination of non-infected. It covered a population of 50,000 in the rural community. This was expanded further towards the end of the II Plan period, when the I.C.M.R. took over the responsibility for this, assisted by the W.H.O. The expanded programme covers a population of over 100,000 in small towns and villages. The new approach is to provide domiciliary treatment with anti-bacterial drugs. The patients are allowed to live in the community without disturbing their normal life, whereas in the previous study all infective cases were isolated and treated in a hospital. In this study patients and their contacts are followed up in their homes at regular intervals. Supervision by a central staff is nominal and it is hoped that in due course, it will be possible to assess whether domiciliary service without hospital treatment and without much supervision can be effective and if so, how far.

An investigation started during the I Plan period and completed during the II Plan period was the National Sample T.B. Survey, to find out the incidence of T.B. (morbidity) in the country.

In this, sampled groups of population in different parts of the country were examined by miniature X-ray and those having abnormal shadows in the chest were further investigated by sputum or laryngeal swab method for detection of tubercle bacilli. The findings of this National Survey are :—

- (1) Prevalence rate for 'active' and 'probably active' tuberculosis varied from 13 to 25 per 1000 population in cities, towns and villages in the different zones.
- (2) The rate of bacteriologically positive cases for 1000 population in these areas varied from 2 to 8.
- (3) Prevalence rates in cities, towns and villages were generally of the same order.
- (4) Prevalence rates were lower for females than for males, specially in age groups above 35 years.
- (5) In general, the prevalence rate showed a continuous increase with age.
- (6) In the cities the higher prevalence among persons living in kutchha houses as compared to those in pucca houses indicated the possible effect of economic and sanitary conditions.
- (7) A large majority of the 'active' and 'probably active' cases had moderately advanced disease.
- (8) Definite cavitation was observed in 4 to 33 per cent of the 'active' and 'probably active' cases, this percentage being generally smaller in the cities.

Another research programme that was started towards the end of I Plan period and continued during the II Plan period was the Chemotherapy Project in Madras. This was under the auspices of the I.C.M.R. with the co-operation of World Health Organisation and the British Medical Research Council. The main object of this study was to gauge the efficacy of domiciliary treatment by the various new anti-bacterial drugs individually or in combination and compare these with the results of hospital treatment to find out whether domiciliary treatment can be as effective as institutional treatment. This investigation has proved that if domiciliary treatment is carried out systematically under close supervision it can be as good, if not better, than sanatorium treatment. As this investigation progressed quite a number of new problems, some

unexpected, came to light which needed further study. One of the important items included in this study was to find out whether the contacts of patients treated at home were exposed to greater danger of infection than the contacts of those treated in hospitals. The studies in this Centre have also confirmed that the virulence of the tubercle bacilli noted in Indian patients varies from what is noted in Western patients. Generally the bacilli in Indian patients are of a lower virulence. In spite of this we have in India a large number of advanced tuberculous cases. Why this is so is a matter that needs further investigation.

The studies in this Centre have proved that combined treatment with two drugs is more effective than single-drug treatment and that the drugs have to be continued at least for one year to minimise chances of relapse.

An assessment of the allergy producing capacity of Indian BCG vaccine was also undertaken by a specially trained team in different parts of India, under the auspices of the I.C.M.R. It is also investigating certain aspects of tuberculin reaction in relation to non-specific infection which is found to be fairly common in some parts of India.

Recommendations :

Situated as we are to-day, the emphasis in anti-tuberculosis work must continue to be on its public health aspects including protection of the vulnerable population, early detection of cases, control of the spread of infection and on attempts at converting an infective case into a non-infective one within the shortest possible time. In regard to early detection special emphasis is required in respect of persons who come into contact with children as well as contacts of cases. The provision of institutional facilities for the hospitalisation of cases of tuberculosis, it must be recognised, is not likely to be feasible for a long time to come to the extent to which it would be necessary to take care even of infective cases. The programmes of B.C.G. vaccination and tuberculosis clinics including facilities for domiciliary chemotherapy therefore, assume great importance in the anti-tuberculosis programme in the coming years.

BCG Vaccination :

It was hoped earlier that the Mass BCG Campaign could be completed by the end of the Second Plan period and replaced during the Third Plan period by a Vaccination Programme which could be carried on as part of the normal programme of a T.B. Clinic and other Sections of the Public Health Department, such as School Health Services and Maternity and Child Welfare Centres. However, the development of

clinics, School Health Services and Maternity and Child Welfare Centres has not occurred during the Second Plan period as was anticipated so as to make it possible to integrate the BCG Vaccination in the Public Health Programme of the States. While this makes it necessary to continue the Mass BCG Vaccination Programme during the Third Plan period, at the same time active steps need to be taken to integrate BCG Vaccination with other T.B. Schemes in the States very early. If the new District T.B. Centres are developed according to the National Plan, each of these Centres should have a special Vaccination team attached to it, whose duty will be to vaccinate all the susceptible persons in the districts, specially the younger groups. The existing BCG teams engaged in Mass Campaign can then be gradually taken in these clinics and permanently absorbed in the Public Health cadre of the States by 1965.

(A note regarding this integration of BCG work with District Clinics is given in Appendix B. 23).

Clinics and Domiciliary Services :

It is disappointing to note that in the course of the two Five Year Plans the progress in respect of tuberculosis clinics has been far from satisfactory in so far as just about 100 T.B. clinics have actually been set up against the target of 300. Even out of these 100 clinics set up some do not still have the requisite complement of trained staff and other minimum requirements. It is understood that the off-take of the supply of X-ray and laboratory equipment to be supplied by the UNICEF is much behind schedule for the reason that the other essential requirements are not forthcoming in the case of many clinics. The programme of one tuberculosis clinic per district cannot by any means be considered ambitious and it should have been possible in the course of 10 years to set up at least one T.B. clinic per district. We attach the highest importance to this programme and recommend that the highest priority be given to this so that a fully equipped and staffed clinic comes into existence in each district with the least possible delay. Since modern chemo-therapy has proved to be very effective and is likely to be the basis of any programme, it is essential to ensure that adequate stock of such drugs are made available at a reasonable cost. A scheme of the staffing pattern of the district clinic is given in Appendix B. 24. The facilities of the demonstration and training centres and the National Tuberculosis Institute should be utilised for giving the workers the required orientation in the tuberculosis control methods.

If the clinics are to make an impact on the tuberculosis problem outside the headquarters towns where they are located, the provision of a mobile van equipped with an X-ray plant at each of these clinics is

essential. This has become imperative in the light of the results of the recent survey bringing out the rate of disease in the rural areas as high as in the urban. The taluk hospitals and the primary health centres in each district should be the point of visit of the mobile vans at stated intervals so that the suspected cases are investigated and treatment given to those found suffering from tuberculosis. As suggested earlier, the district clinics would also become the base from which the B.C.G. vaccination team operates in each district. This programme of one district per clinic can be considered only as the first stage in the development of tuberculosis control measures as the coverage of the entire district by one clinic is bound to be inadequate and patchy. It is therefore, suggested that before the end of the Fourth Plan period tuberculosis clinics must be increased in number so that one such clinic is available for every one million of the population. The programme of training of workers with this end in view should be initiated from now on.

Other directions of Development :

The setting up of demonstration and training centres in T.B., one for each State, must be considered a *sine qua non* for the development of an efficient anti-tuberculosis service in each State. The facilities offered by the National Tuberculosis Institute for training of leaders in anti-tuberculosis work also needs to be utilised to the fullest extent. With the extremely poor housing conditions on the one hand and the limited hospital beds on the other, it is also necessary that facilities for isolation of advanced or infective cases should be provided on a much larger scale than is contemplated at present, and at much greater speed. We suggest that at least 50,000 beds be available in the country of the types which have been provided so far for purposes of isolation. Rehabilitation and after-care facilities, although likely to be required on a much smaller scale than previously, cannot be done away with altogether.

In regard to hospital beds for the treatment of tuberculosis, the existing number of about 30,000 is far too insufficient for the estimated total of a million and a half cases of open tuberculosis. Tuberculosis has been controlled today in many western countries to such an extent as to leave a large proportion of the T.B. beds idle. We are, however, far from reaching that stage and while priority must be given to the vaccination and clinic programme, expansion of the hospital facilities needs also to be carried out simultaneously so that at least a part of the total need for hospitalisation can be met. For this purpose, we suggest that our immediate aim should be for a bed strength of not less than 100,000. Housing, environmental sanitation and nutrition are other factors which are closely related to the incidental spread of tuberculosis. These matters are however, referred to elsewhere in our report.

Administrative Organisation :

A mention has been made earlier about the appointment of Assistant Directors of Health Services for tuberculosis in some of the States under schemes subsidised by the Central Government. Although normally tuberculosis should be a part of the administrative set-up in the Directorates for the control of communicable diseases, it appears to us that in the present state of development, it would be necessary to have an officer in the Directorate of Health Services of each State exclusively incharge of the tuberculosis programme. Even where such an officer is in position, difficulties have been experienced in regard to the co-ordination of various anti-tuberculosis programmes. In States where there are separate Directors of Medical and Public Health Services, the B.C.G. teams are controlled by the Public Health Departments while the rest of the work comes largely within the purview of the Directors of Medical Services. Even where there is a combined Director of Medical and Health Services, the Medical Division under him control the clinics and the hospitals while the B.C.G. work, etc., is done by the Public Health Division. This arrangement is far from satisfactory. In view of the great importance of tuberculosis control for national health it is very necessary that a State Tuberculosis Controller should be appointed in every State Health Directorate who will be incharge of all tuberculosis services both preventive and curative. Great emphasis should be laid on the preventive aspects of the disease. The State Tuberculosis Officers should have requisite training and experience for the management of tuberculosis control programme, including tuberculosis hospitals. The entire tuberculosis service should function as one unitary service in the State Health Directorate.

There have been difficulties in the recruitment of suitable staff for T.B. clinics and other T.B. programmes. Unattractive remuneration and lack of prospects of promotion are the principal factors in this. Tuberculosis workers should not therefore, remain an isolated group, but be treated as a part of the State Health Cadres so that in course of time the normal avenues of promotion should be open to them. Private practice should in no case, be permitted to doctors doing tuberculosis work as it is bound to divert their attention away from their main task of T.B. control.

It is also suggested in this connection that as large a use should be made of non-medical ancillary personnel as possible in the tuberculosis programme.

Voluntary Effort :

The Bhore Committee has rightly emphasised the importance of non-official effort in the tuberculosis field and this has been emphasised

by the T.B. Expert Committee of the W.H.O. As the Governments cannot be expected to take all responsibilities for tuberculosis control work in a country, it is only reasonable to recommend that Governments should give all possible encouragement to non-official organisations.

(5) LEPROSY.

Introduction :

The Bhore Committee had reviewed the extent of the leprosy problem in the country and made certain recommendations for combating the disease. They pointed out that there were at least a million cases of leprosy in the endemic areas of the country, and that the incidence varied from 2% to 5% in most endemic areas though, in some parts it was as high as 10% to 20%. Arrangements for the institutional treatment of cases were found to be grossly inadequate, the total in-patient accommodation in the country being adequate for only 15,000 cases as against a quarter of a million estimated cases of the infective type requiring hospitalisation. Leprosy work in general was being carried out mostly by voluntary agencies such as Mission to Lepers, the British Empire Leprosy Association (Indian Branch) and by a few other organisations. The Central and State Governments had not entered the field in any big way with comprehensive programmes for dealing with this problem.

The Bhore Committee had made some general recommendations for the control of the disease. It had emphasised that leprosy should be dealt with as a public health problem, and had drawn attention to the inescapable responsibility of the Central and State Governments for adequate measures against the disease. The Committee had also pointed out the need for segregation of leprosy patients in order to control the spread of the disease and had particularly highlighted the problem of this disease in beggars and in certain industrial communities.

Dr. Cochrane stated that "Leprosy work in India was started, in the first instance, by those having a desire to help a needy section of the community, but it was done solely on religious and philanthropic grounds with no attempt at eradicating the disease. . . . Leprosy work was first undertaken merely as a work of compassion." The work of the voluntary agencies active in this field was influenced by the above considerations, and efforts were mostly directed towards providing institutional accommodation in so-called leprosy asylums or homes in certain parts of the country.

We are happy to note that, since Independence, there has been a remarkable change in the outlook on leprosy. The introduction of sul-

phone therapy has been greatly responsible in bringing about this change, especially the observation that treatment with sulphones readily brings about clinical improvement and renders the cases bacteriologically negative in due course. A new approach to the control of the disease has thus come in sight. In 1949, the Indian Council of Medical Research put out a memorandum, "Treatment of Leprosy Patients in their own homes—an approach to the problem of control of leprosy in endemic areas." The basic philosophy underlying home treatment of patients for the control of infection was stressed by the W.H.O. Leprosy Expert Committee in 1952 and it was later also endorsed by the Sixth International Leprosy Congress at Madrid in 1953. The concept was first put to practical use by the Gandhi Memorial Leprosy Foundation in India in 1951, and by the Government of India towards the end of the First Five Year Plan period and in the successive Five Year Plans.

We will now review briefly the work done by the Central and State Governments, and by the voluntary agencies since the publication of Bhore Committee's Report.

Work undertaken by the Central and State Governments :

Towards the end of the First Five Year Plan period, the Government of India decided to organise a National Leprosy Control Programme in co-operation with the States in many endemic areas. Accordingly, centres were started for dealing with the disease on an organised basis. These centres were of two types :

- (a) treatment and study centres ; and
- (b) subsidiary centres.

It was planned to undertake chemoprophylaxis of the population at risk with the administration of sulphones on a mass scale at the treatment and study centres, to assess the therapeutic efficacy of the drug, make bacteriological and haematological studies of the treated cases, and to study the incidence of the disease in healthy contacts and other relevant factors. In the subsidiary centres, mass therapy was to be attempted after preliminary surveys, and no special studies were to be carried out. These centres were established in areas where the incidence of the disease was over 1% and at any rate not less than 0.5%. Each centre was to deal with a population of 80,000 or thereabouts, and in as compact an area as possible, usually 5 to 10 sq. miles. The centres thus established, upto December, 1960, are given in the following table :—

The total number of Centres established till December 30th, 1960, is 125.

State	Treatment & Study Centre	Subsidiary Centre	Total
Andhra Pradesh	—	15	15
Assam	—	1	1
Bihar	—	17	17
Gujarat	—	2	2
Himachal Pradesh	—	3	3
Kerala	—	3	3
Madhya Pradesh	1	4	5
Madras	1	13	14
Maharashtra	—	22	22
Manipur	—	3	3
Mysore	—	8	8
Orissa	—	15	15
Punjab	—	2	2
Uttar Pradesh	1	7	8
West Bengal	1	6	7
	4	121	125

It would appear, however, that the work planned for the study centres has not progressed to the desired extent. The work done in the subsidiary centres has progressed considerably. Many initial difficulties were encountered in the organisation of the work; dearth of suitably qualified officers, as also of suitably trained para-medical workers, was keenly felt. The work accomplished up to the end of March, 1960, is summarised in the following table:—

(i) Total number of subsidiary centres :	105
(ii) Population of the project areas :	1,33,69,981
(iii) Population surveyed :	84,06,900
(iv) Known cases of leprosy :	1,03,776
(v) Cases registered for treatment :	92,910
(vi) Cases treated :	55,653
(vii) Healthy contacts under observation :	2,46,469

It is the intention to establish many more centres in the Third Five Year Plan period—30 or more control units of a modified type covering a population of 1 to 1.5 lakhs in areas of high endemicity and at least 140 subsidiary centres elsewhere, where leprosy is a problem.

In addition it is proposed to establish ten training centres and two or three rehabilitation centres as well. The organizational pattern has been worked out in detail and emphasis at these centres will be on survey, education of the community and training of personnel (S.E.T. Pattern).

In order to co-ordinate the work on an all-India basis, the Central Government has established a Leprosy Advisory Committee with the Union Health Minister as the Chairman and with representatives of the voluntary organisations as members to review the working of the leprosy schemes in different parts of the country to suggest measures for the improvement of existing schemes and to consider requests for grants-in-aid to voluntary organisations.

It might be mentioned that the Central Government has made itself responsible for 100% non-recurring and 50% recurring expenditure of all the centres established in the States. In addition, both the Central and State Governments have been giving grants-in-aid to voluntary organisations for conducting anti-leprosy work in the country.

Work of Voluntary Organisations :

A notable event in the post-Independence era has been the establishment of the Gandhi Memorial Leprosy Foundation under the auspices of the Gandhi Smarak Nidhi. Recently, this Foundation was made an autonomous institution by the Nidhi. The Gandhi Memorial Leprosy Foundation, from its inception, has concentrated its work on certain pilot projects, primarily with a view to finding out solutions to a number of problems, which solutions could then be utilised for developing the National Anti-leprosy Campaign. By the end of 1959, it had established 10 control centres catering to a population of about 209,000. The programme of work followed the S.E.T. pattern. Most of this work was carried out under the supervision of trained medical officers, utilising, to a very considerable extent, the services of para-medical workers. A training centre for para-medical workers was established and, during the course of 9 years of its existence, it has trained more than 120 such workers, mostly deputed by the State Governments and private agencies. The experts of the Foundation have rendered very useful service in the shape of advice and guidance to a number of States in the development of their Leprosy Control Programmes. We are happy to note that assessment of work done was a feature incorporated in the programme from its very beginning. The other voluntary organisations have expanded their activities a great deal.

Mission to Lepers :

This oldest agency, whose early work was fully reviewed by the Bhore Committee, has engaged itself recently in diverse activities. These cover *inter alia* institutional accommodation, surgical aid, and rehabilitation. In 1937, the 32 institutions run or aided by the Mission had 8,000 in-patients. By the end of 1959, as the number of institutions increased to 38, over 10,000 in-patients and 45,000 out-patients were treated.

Notable among its activities are the establishment of a physiotherapy centre, institution of occupational therapy projects, organisation of adult literacy classes and establishment of a rural health centre. The Schieffelin Leprosy Research Sanatorium at Karigiri admits cases of interest to the surgeon, physician, or pathologist, with an eye on research and is doing specialised surgical work including plastic surgery. Experiments in rehabilitation include a mat-weaving industry in which patients from the weaver class are engaged. A proposal to rehabilitate these patients in their villages is under way. It can thus be truly said that the Mission is 'meeting new challenges in the investigation and treatment of the disease'.

Hindu Kusht Nivaran Sangh :

The British Empire Leprosy Relief Association has been functioning since Independence under a new name, the Hindu Kusht Nivaran Sangh. The Sangh had done pioneering work in the past in the field of surveys, treatment and research. A research centre was established by the Association at Calcutta. The activities of this centre have now been taken over by the Indian Council of Medical Research. Health education and publicity have received increasing attention of the Sangh during the past few years. The Sangh has played a very useful role in organising refresher courses for physiotherapy technicians at Vellore and has published considerable material for use in health education work. The quarterly journal 'Leprosy in India' is supported by the Sangh. The Sangh has played a notable part in yet another direction. It has made itself responsible for the organisation of conference of leprosy workers in the country year after year. These conferences have helped to bring together these workers for exchange of views and sharing of experiences, have served to promote wider interest in leprosy, and have assisted in the formulation of broad policies for the control of the disease.

Belgian Leprosy Centre :

Another interesting development has been the establishment of the Belgian Leprosy Centre with financial support from that country.

The centre has functioned for a period of five years in an area in the Chingleput District of Madras State. It has essentially followed the pattern of work in respect of surveys, education and training as in vogue elsewhere and has covered nearly 500,000 people in 750 villages in the three districts of the Madras State which are highly endemic areas. The centre has provided temporary hospitalisation, physiotherapy and orthopaedic treatment. The centre, after five years of useful work, is being taken over by the Government of India.

Other Agencies :

In addition to the above, there are nearly 200 voluntary agencies, which are doing useful work in several parts of the country. Some are running colonies, others are running out-patients departments. It is gratifying to note that many of these agencies are adopting the modern approach to the control of leprosy.

Extent of the problem :

There are two main sources from which the present data relating to the prevalence of leprosy in the community have been derived. The first is the Report of the Committee for the Control of Leprosy published by the Government of India in 1955. This report was based on the information available upto 1954 and gives the incidence of the disease district-wise in relation to the 1941 or 1951 census population of each district. The total number of leprosy cases has been estimated to be 25 lakhs. It might be pointed out, however, that the above estimate was based on data collected from surveys which were not always properly carried out. Indeed, the incidence reported later by the State Leprosy Officers and the leprosy subsidiary centres was much higher than that reported by this Committee.

The second source is the reports of the State Leprosy Officers based on the surveys carried out in the control units established under the aegis of the National Leprosy Central Programme and the Gandhi Memorial Leprosy Foundation. Information, however, is not available for all districts and it is not reliable in many cases. Wherever available, the incidence reported is generally 2 or 3 times greater than that reported in the 1955 Leprosy Report.

Population living in areas of endemicity :

At a most conservative estimate, about 205 million people live in endemic zones which include urban, rural and hilly areas. Of these, about 44 million live in urban areas, 156 million in rural areas and

about 5 million in the hilly regions. The distribution of this population Statewise, according to the above categories, is given in Appendix B. 21.

Total number of patients :

By comparing the data pertaining to the incidence of leprosy, collected from different sources, Dr. Wardekar has suggested "a working figure for prevalence in each State", for obtaining some idea about the size of the problem. On this basis, the figures of prevalence of leprosy in different States are given in the Appendix B. 25.

From the perusal of this data, it would appear that the total number of leprosy patients in the country is certainly not less than 20 lakhs.

Infectious cases :

The Bhore Committee had suggested that, while in the country as a whole, the number of lepromatous cases was about 20 per cent of the total number of patients, there were areas where the proportion of this severe type of the disease was as low as 4 per cent and others where it was even 50 per cent. Even at the average rate of 20 per cent, there are probably at least 4 lakhs infectious cases out of 20 lakhs in the whole country.

Number of cases showing deformities due to leprosy :

Leprosy leads to deformity of the face, hands and feet. The Sub-Committee on Rehabilitation appointed by the Leprosy Advisory Board of the Government of India in March, 1960, has estimated the over-all incidence of deformities at 20 to 25 per cent. There are, therefore, today about 5 lakh leprosy patients with deformities of one type or the other. A majority of such patients find it difficult to lead a normal life. Many of them are forced out of employment and some, about one to two lakhs, are found to have taken to begging.

Rehabilitation :

There is no reliable information regarding the number of leprosy patients who would need rehabilitation. It has been roughly estimated that there are about 2 lakh leprosy patients who follow the profession of begging, and obviously there must be many others who are on the verge of taking to it. In addition to the above there are at a conservative estimate nearly 3 lakh cases of leprosy which need rehabilitation in some shape or form. We wish to point out, however, that the problem of rehabilitation should be viewed in its proper perspective.

It is not the leprosy patient alone who needs rehabilitation. About 2 million persons suffer from blindness, 800,000 from deafness, and millions of others have other types of disabilities. These, too, require rehabilitation. The magnitude of the problem is thus enormous.

As regards the number of leprosy patients who are already rehabilitated, it would appear that about 5,000 out of 20,000 patients are the permanent residents of in-patient institutions. Some of them are completely crippled, while others are able to undertake some kind of work. A majority of them are engaged as agricultural labourers. These individuals are said to be rehabilitated. However, the Sub-Committee appointed by the Leprosy Advisory Board in March, 1960, has expressed the following view :

"This Committee deplores the use of the word 'rehabilitation' to describe agriculture colonies where no care is taken about the progressive damage to hands and feet and where patients, who could return to their normal environment, are kept unnecessarily segregated for the sake of their support."

We agree with the view expressed by the Sub-Committee that such institutions are settlements of leprosy patients and not rehabilitation centres. The aim of rehabilitation should be to return the patients back to their homes in normal environment and any programme for the control of the disease should have this object in view.

Prospect and Retrospect :

In the foregoing account we have indicated the magnitude of the problem and the brief review of activities carried out by several agencies, governmental and others, in dealing with the problem. To summarise the position, in 1941 there were 14 thousand patients accommodated in 92 in-patient institutions. In 1954, 20,000 patients were being treated in 102 institutions. Since then, some increase has taken place in the provision of beds in in-patient institutions though the increase is not of the magnitude required. So far as facilities for treatment of patients at the out-patient clinics are concerned, it might be stated that in 1954 there were some 120,000 patients in 1,200 out-patient clinics in different States in the country. By the end of March, 1960, the number treated has nearly doubled and there are today nearly 1300 out-door clinics excluding the 123 associated with control units. How grossly inadequate the existing facilities are, will be realised when it is seen that only 5% of the total infectious cases can really be isolated or treated in the existing in-patient institutions and only 15% of the total number of patients are being treated in the out-patient clinics.

Theoretically speaking the leprosy problem can be tackled in various ways. One approach is to segregate the infectious cases, provide homes for beggars and rehabilitate those who need rehabilitation. Treatment was incidental. The other approach is that of early detection of cases and to treat them effectively so that they are rendered non-infective, and do not spread the disease. The financial implications of segregation must be noted. It has been estimated that the cost of maintaining one patient for one year in a leprosy colony is about Rs. 450. On this basis nearly a crore of rupees are being spent on the current institutional programme alone. Obviously, therefore, it is will not be possible to provide institutional facilities for all the patients estimated to be 4 lakhs.

Segregation, to be effective, will have to be done at the earliest possible moment when the patient shows signs and symptoms of leprosy. In practice, this is not always feasible and once the segregation is accepted as an official policy, the patient will certainly evade all attempts at detection. In practice, therefore, only those who show obvious signs and symptoms of the disease can be segregated and by that time they would have already infected many others. In the light of such circumstances, segregation cannot be considered as a practical approach for the eradication of leprosy. Emphasis has got to be laid on the early detection and treatment of cases.

We are very happy to note that this new outlook in dealing with the leprosy problem has been recognised in recent years by all concerned. A beginning had been made in this direction in the Second Five Year Plan and the facilities created will be expanded further in the Third Five Year Plan period. We are aware that, as in the case of other public health programmes, the bottle-neck in the successful implementation of the programme is the lack of trained personnel, both medical and para-medical. We recommend that a determined attempt be made to train such personnel at as many centres as possible. In this connection we would like to draw attention to the need for utilising para-medical workers in as large a measure as possible and thus relieve the medical officers from those duties which can be adequately performed by the former category of workers. The experience gained in recent years at many centres shows that the programme can be effectively carried out by the para-medical workers under the general guidance of a medical consultant.

We have already referred to the problem of rehabilitation of leprosy patients. As the national programme for the control of leprosy develops, the number of patients needing rehabilitation will diminish—

though slowly. For some time to come, some steps will have to be taken to provide facilities in respect of rehabilitation. We recommend that wherever possible simple physiotherapeutic measures should be introduced at such treatment centres where the facilities for the purpose can be readily provided, and attempts should be made to educate the patients to take care of their hands and feet, so as to prevent the occurrence of deformities. Sufficient knowledge is now available in this regard. We are happy to note that, as a result of work carried out in Vellore under the auspices of the Indian Council of Medical Research, many operative procedures have been developed for the correction of deformities. We suggest that centres for reconstructive surgery should be established at suitable centres to make these techniques available to as many patients as possible.

We wish to sound, at this stage, a note of concern. The National Leprosy Programme has been in operation for the last seven years or so. It is essential now to evaluate the results of the programme. Assuming that the programme is executed according to the pattern laid down, it is imperative to be sure that the effect will ultimately result in the eradication of the disease. We realise that, as a pre-requisite to such an effort there will be the need to maintain adequate records on which to base valid conclusions. Again, as far as we are aware, no indices have been worked out which would help in the ultimate evaluation. We strongly recommend that, pending the analysis of current programmes, the work of the treatment and study centres in the Third Five Year Plan should be so organised as to permit such an assessment in the near future.

In suggesting the above procedure we have yet another facet of the problem in view, viz., the development of the disease in contacts of leprosy cases, particularly children. It is known that children develop the disease much earlier than adults. Many attempts have been made in the past for prevention of infection in them by segregating them from their infected parents. However, such an approach has not yielded desirable results for various reasons. Recent observations have indicated the possible use of chemoprophylaxis in contacts for prevention of infection in them, as well as the use of BCG vaccination for the purpose. No positive data are yet available regarding the efficacy of these two methods. Obviously, this is a matter for research and we are glad to note that the Indian Council of Medical Research has taken steps to investigate this aspect of the problem.

Leprosy Advisory Committee

The Government of India constituted a Leprosy Advisory Committee in February, 1958. The Union Health Minister is the Chairman of the Committee which is composed of representatives of the Government of India and representatives of each of the following leading organisations doing work on leprosy :

- (i) Hind Kusht Nivaran Sangh, Red Cross Road, New Delhi ;
- (ii) Mission to Lepers, Purulia ;
- (iii) Maharogi Seva Mandal, Wardha ;
- (iv) Gandhi Memorial Leprosy Foundation, Wardha ;
- (v) Gandhi Smarak Nidhi, Rajghat, Delhi ;
- (vi) Ramakrishna Mission, Howrah ;
- (vii) Belgian Leprosy Centre, Chingleput District, Madras ;
- (viii) Vidharbha Maharogi Seva Mandal, Jagdamba Kushtdham Tapovan, Amroati.

In addition to these, representatives of State Governments attend the meetings of this Committee as observers. The functions of this Committee are :—

- (1) To review the working of the Leprosy Control Scheme in different parts of the country ;
- (2) To suggest measures for the improvement of the existing schemes ; and
- (3) To consider requests for grants from voluntary institutions for assistance for leprosy work and to make recommendations to Government.

(6) SMALLPOX

Smallpox, which has been ravaging the country for centuries, is one of the major epidemic diseases of India. Its striking feature is the variability in its incidence. In India, long before the era of vaccination was ushered in early in the 19th Century by Jenner's discovery of the protective value of cowpox against smallpox, smallpox was sought to be prevented by inoculation of individuals with material containing smallpox virus. This measure had many drawbacks and was supplanted by Jenner's vaccination.

But, for a variety of reasons, the progress of vaccination has been slow and not fully fruitful. A sizable number of cases keep occurring every year. It is stated in the Bhore Committee's report that,

"within the period of 60 years from 1880-1940, the average annual rate of smallpox mortality per thousand of the population has ranged from 0.1 to 0.8" and, "even after making allowance for such variability, there is reason to believe that the total incidence of the disease has decreased in the country as a whole." "For instance", the report says, "if the two ten-year periods, 1902-1911 and 1932-1941, are compared and due allowance is made for the increase in the population of the country, the rates of mortality from smallpox per 100,000 of the population are seen to be 40 and 25 respectively. Nevertheless, it is a matter for serious concern that the average number of deaths per year from smallpox for the period 1932-1941 should have been as high as 69,474" The report adds in connection with this disease that the "rate of incidence of smallpox in India is the highest among all the countries for which statistics are given" and goes on to say, "that the large amount of suffering and mortality for which smallpox is responsible should be permitted to continue is all the more regrettable because we have in vaccination a powerful weapon with which the disease can be kept under effective control".

Vaccination, the report says, "was the first preventive measure which was introduced in India and practised on a large scale." Nevertheless, primary vaccination is compulsory only in about 81% of the towns of India and 62% of the rural circles. Indeed, in Bombay Presidency, which first adopted vaccination, primary vaccination is enforced only in 4.9% of the rural circles, while in the North-West Frontier Province, the United Provinces, Sind, Coorg and Ajmer-Merwara it is not compulsory even in a single rural circle. The position as regards revaccination is even worse."

With regard to the manufacture of vaccine lymph, the report mentions seven provincial centres, e.g., Ranchi (Bihar), Nagpur (Central Provinces), Guindy (Madras), Calcutta (Bengal), Patwa Dangar (United Provinces), Lahore (Punjab, belongs to Pakistan now) and Belgaum (Bombay) where lymph is manufactured. Centres in some of the erstwhile Indian States like Travancore and Mysore were mentioned in that report. Since then the following additional centres have been established, one each at Hyderabad (Andhra Pradesh), Shillong

(Assam), Trivandrum (Kerala), Manpur (Madhya Pradesh), Bangalore (Mysore), Amritsar (Punjab) and Calcutta (Corporation Centre).

In all Provinces, the report says, "there seems to have grown up the practice of carrying out routine vaccination mainly during the cooler months of the year. The reason for this is, we understand, the need for avoiding deterioration of the quality of the lymph during transit from the laboratory where it is produced and during its use for vaccinating the people. The period during which large scale vaccination operations are performed in the provinces thus becomes limited to six or seven months in the year. This is, in our view, unfortunate because what is required is an intensive effort to immunise the community as a whole and to keep up the high level of protection so attained by periodical revaccination. A lengthening of the vaccination season to cover all the twelve months is highly desirable. The development of the necessary facilities for cold storage and for the transport of vaccine lymph for use in the field should not prove difficult in the coming years."

What is said above is the position relating to smallpox as reviewed by the Bhore Committee in its report released in the year 1946.

What is the position now after a lapse of nearly 15 years? Smallpox has continued to take a heavy toll of human life every year. The incidence of the disease and the deaths that it has been causing during the years 1950 to 1958, given below, will indicate the trends of smallpox incidence in the recent past:—

Year	Smallpox	
	Attacks*	Deaths
1950	1,27,633	75,364
1951	1,67,406	1,47,694
1952	87,049	35,757
1953	33,834	21,856
1954	39,916	25,602
1955	26,282	23,485
1956	24,334	17,227
1957	1,04,058	42,482
1958	1,06,501	32,174

* Incomplete information

A pertinent question to ask is why, inspite of continuing vaccination effort throughout the country, no worthwhile reduction has been made in the incidence of this disease. It is a safe assumption that the recorded number of vaccinations reported yearly in the various parts of the country by no means reflects the actual number of vaccinations carried out. It is also an undisputed fact that a number of factors have been militating against the success of vaccination effort. Chief amongst these are the difficulties of keeping lymph potent for long enough periods to make it possible to despatch it to the remotest corners of the country and to take it for use in time, faulty techniques of vaccination adopted by improperly trained vaccinators, and last, but not least, the actions of ill-informed people resulting in nullification of the effect of vaccination.

Up to now, no concerted and properly controlled vaccination drive has been organised; and only in the presence of epidemics are efforts made to vaccinate the threatened population; the result is that only a temporary check is imposed on the incidence of the disease. Haphazard measures can never achieve eradication of a disease which has been ravaging the country for centuries.

In 1958, the Government of India appointed an expert committee to examine the questions of smallpox and cholera and to make appropriate recommendations for dealing with these two diseases. This committee submitted its report to the Government in 1959, and its recommendations were accepted by the Government. The Government decided to deal with smallpox in the first instance. In respect of this disease the committee has made the following observations:—

"It would appear that smallpox shows a definite seasonal prevalence and that the incidence reaches epidemic proportions during the first six months of the year."

"Another interesting feature is that smallpox generally shows periodicity, the incidence being significantly high every five or six years. This has been attributed by public health authorities to the accumulation of susceptibles as a result of faulty registration of births leading to non-vaccination of unregistered infants, indifferent techniques of vaccination, waning immunity after primary vaccination, and absence of a definite programme of revaccination.

"The figures of the incidence of smallpox in different age groups are not readily available in respect of several States. Studies conducted in U.P. have shown some significant trends. In the following table, the relative percentages of deaths from small-

pox in the age groups 0-1, 1-10 and the groups containing all others above 10, for the quinquennial period beginning from 1895, are given :

Smallpox mortality in Uttar Pradesh* according to age groups, (1896-1954)

TABLE

Period	Percentage of total smallpox deaths		
	0-1	1-10	11 & above
1	2	3	4
1895-99	32	56	12
1900-04	38	51	11
1905-09	32.5	51	16.5
1910-14	33	57	10
1915-19	32	49	19
1920-24	26	48	26
1925-29	29	46.5	24.5
1930-34	26	40	34
1935-39	24	32.5	43.5
1940-44	18	27	55
1945-49	24	30.5	45.5
1950-54	18.5	24.5	57.0

* Smallpox in U.P. by K. M. Lal and G. S. Murty, J. Ind. Med. Assoc., 1958, Vol. XXX, pp. 120-126.

"It will be seen that there has been a gradual decline in the percentage of deaths in the first two age groups with a relative increase in the age group '11 and above'. This gradual decline in the death rate among young children can be attributed to an effective programme of primary vaccination, while the increase in the age group '11 and above' is an indication of waning immunity after primary vaccination. This points to the need for revaccination.

"When figures of primary vaccinations and revaccinations are considered, it appears that a very large effort is made in each State every year. While this can be assumed to be the cause of a general lowering of the magnitudes of the epidemics of smallpox during recent years, the total gain is not commensurate with the vaccinations performed. This state of affairs would justify the belief that there are lacunae in the present vaccination programmes,

"The importance of accurate registration of births and deaths cannot be overstressed. Unless it is known how many babies have been born, it cannot be made certain that primary vaccination has been carried out with cent per cent coverage. Deaths, if registered disease-wise, would help focus attention on preventible diseases that take heavy toll of life and would enable the public health authorities to take appropriate control measures."

The present position in respect of registration of births and deaths in the constituent States of India is far from satisfactory. With the exception of one or two, the States have not yet been able to organise collection of this vital information in a satisfactory manner.

The position in regard to legal provisions regarding primary vaccination and revaccination is as indicated below :

Primary vaccination and re-vaccination are compulsory in the Andhra and Telangana areas of Andhra Pradesh, in Madras, Punjab and Delhi. In Bihar, Maharashtra, Gujerat, Mysore and Rajasthan only primary vaccination is compulsory. In Assam vaccination is not compulsory at all times but is enforced temporarily in affected areas during the period of emergency. In Orissa primary vaccination is compulsory under the Bengal Vaccination Act in the districts of Cuttack, Puri and Balasore. Primary vaccination and re-vaccination are however, compulsory in the Ganjam Plains under the Madras Local Boards Act. While this is the position generally, emergency powers under the Epidemic Diseases Act are made use of by all the States for compulsory primary vaccination and re-vaccination in times of epidemics.

After a thorough examination of the question of smallpox in all its aspects, the Expert Committee made the following recommendations :—

"(1) Registration of births and deaths

In view of the multiplicity of practices in regard to registration of births and deaths leading to unsatisfactory results and with the object of improving the situation the Committee recommends :

- (a) that there should be an Act making registration of vital events compulsory and that that Act should legislate for the provision of proper facilities for registration, setting up of registering offices easily accessible to those reporting vital events, and awarding of punishment for lapses in the duties of reporting or recording of vital events ;

- (b) that the Secretary of Gram Panchayat should be appointed Registrar of Births and Deaths for his area ;
- (c) that the Secretary of Gram Panchayat should send figures of vital statistics to the Block office from where such information could be forwarded to the sub-division or District office ;
- (d) that arrangements should be made for the peripheral reporting officials to send information about births and deaths by post on unstamped cards, the postage charges being recoverable by the postal authorities later on in consolidated amount in a manner similar to the one adopted in respect of commercial concerns ; or perhaps, the Committee felt, the Centre could give exemption from affixing of postage stamps on communications notifying births and deaths ;
- (e) that the registers containing records of vital events should be preserved ;
- (f) that the officers of the health administration should have the right to inspect these registers ;
- (g) that before a child is admitted to a primary school, even in the villages, the parents should be required to produce a certificate of his/her birth. Such a practice, the Committee felt, would compel the parents to have the births of their children registered ;
- (h) that the power to prosecute for lapses in reporting or registration of vital events should be vested in the District Health Officers instead of the Tehsildars.

(2) Legal Provisions

- (a) A Central Infectious Diseases Control Act should be promulgated, more or less on the lines of the Central Food Adulteration Act, to ensure uniform procedures all over the country in respect of control of smallpox ;
- (b) one authority in each State should be entrusted with the task of enforcement of legal provisions in respect of vaccination ; and
- (c) both primary vaccination and revaccination should be made compulsory.

(3) Early detection and notification of cases

In view of the importance of early recognition of cases, and taking into account the several views expressed in this regard, the Committee recommends that :—

- (a) it would be better to place the responsibility of notification on the Panchayats because the Chowkidar or the Gram Sevak or the Village Headman will presumably be under the control of the Panchayat ;
- (b) the Panchayat Secretary should transmit the information to health authorities by telegram where a telegraph office exists, otherwise by a special messenger, and the doctor in charge of Primary Health Centre or the Sanitary Inspector and the District Medical Officer of Health should be informed by him simultaneously ; and
- (c) for the guidance of chowkidars and others, special instructions should be prepared to help them to recognise cases and impress on them the necessity of reporting them without delay.

(4) Purity and potency of vaccine lymph

- (a) Purity —The Committee recommends that, while vaccine lymph has to conform to the specifications laid down in the Drugs Act of 1940, suitable laboratory procedures should be adopted for the elimination of pathogenic staphylococci from lymph.
- (b) Potency —To secure uniformity in the potency of lymph and to know whether issued lymph, during the period between its despatch and use, has not lost its potency, the Committee recommends that :—
 - (i) batches of lymph manufactured by different laboratories should be tested at a central place designated for the purpose as a reference laboratory, and
 - (ii) arrangements should be made to return random samples of the lymph issued for use in the field to the issuing laboratory for testing.

By adopting the procedures mentioned at (i) and (ii) above, it would become possible to take appropriate measure to remedy defects when noticed.

(5) Utilisation of lymph in the field

- (a) Age when primary vaccination can be given—The Committee, while recommending that the practice of giving primary vaccination within the age period 4 to 6 months should be continued, saw no scientific reason why vaccination should not be performed even at an earlier age, should that become necessary because of the presence of smallpox in the area.
- (b) Interval between primary vaccination and revaccination—In view of the fact that immunity conferred by primary vaccination gradually diminishes, it is necessary to boost it up by periodic revaccinations. The first revaccination should be done at the age of 5 and subsequent ones should be given every five years till age 15 is reached. To facilitate fulfilment of this recommendation, arrangements should be made to vaccinate all children at the time of entry to school, again at age 10 and then at the time of leaving school. The question of giving revaccination after the age of 15 will require to be considered in the light of the results obtained from the proposed programme
- (c) Technique of vaccination—As regards the technique of vaccination, the Committee recommends that, while the multiple pressure method would normally be the method of choice, the rotary lancet techniques should continue to be employed in the mass vaccination campaign because of its simplicity and the familiarity of the Vaccinators with its use.
- (d) Number of insertions—The Committee recommends that the number of insertions in primary vaccination should be four, two on each arm, or, if so desired, three on one arm. In case of primary vaccination in persons who have passed the age of 12, only one insertion should be given.

(6) Smallpox eradication programme

The Committee recommends that steps should be taken to launch with the least possible delay a national smallpox eradication programme, with the avowed object of successfully vaccinating the entire population as far as practicable, and completing the programme within a period of three years. This would necessitate a concerted and simultaneous action in all the States of India.

The Committee further recommends that, in order to attain the aforesaid object, immediate action should be taken on the lines indicated in the subsequent part of this section to :

- (a) ensure availability of adequate supplies of vaccine lymph,
- (b) recruit and train adequate numbers of vaccinators and other personnel required for the campaign,
- (c) obtain necessary equipment for vaccination work and storage of vaccine lymph at all levels,
- (d) bring into being a suitable organisation, both at the Centre and in the States, to ensure smooth functioning of the campaign, and, above all,
- (e) prepare the population well in advance to receive the programme as outlined.

(7) Augmentation of vaccine lymph supplies

The Committee recommends that :—

- (a) Immediate steps should be taken by each of the manufacturing centres to augment its lymph production ;
- (b) the States which do not have lymph producing facilities *should take necessary action to set up lymph producing centres ; and*
- (c) estimates of lymph requirements should be worked out by each State for itself, taking into account the need to maintain adequate reserves so as to ensure continued *availability of supplies in the event of breakdowns in* lymph production.

(8) Use of freeze-dried vaccine

The Committee realised that freeze-dried vaccine, if made available, would facilitate the implementation of the mass vaccination programme. However, the Committee wished to point out that the control and ultimate eradication of smallpox need not depend on the availability of freeze-dried vaccine and that liquid vaccine, which is more easily prepared, can serve the purpose equally well when kept and transported under suitable conditions.

(9) Storage and distribution of vaccine lymph

The Committee recommends that subsidiary storage depots should be established at district headquarters and at some selected thana headquarters, taking into consideration the size of the districts and the availability or otherwise of suitable communications.

(10) Recruitment and training of vaccinators

The Committee recommends that :—

- (i) About 20,000 Vaccinators should be recruited to complete the programme within the stipulated period ;
- (ii) the Vaccinators should be recruited from within the district and given the necessary training at district headquarters ;
- (iii) it should be accepted as sufficient if those who have studied upto middle vernacular or 7th standard are chosen for such training ;
- (iv) the period of training should be one month during which some essential knowledge of health education techniques should also be imparted.

The Committee further recommends that the required number of Vaccinators should be recruited one month prior to the inauguration of the campaign, so that, after training, their services can be immediately utilised for the mass vaccination work. The period of service of the Vaccinator should be deemed to have begun from the date they were recruited for training.

(11) Equipment

The Committee recommends that steps should be taken well in advance for securing the necessary vehicles for the use of the field staff, as well as refrigerators, projectors, generators, etc.

(12) Some important points to be attended to for the success of the mass vaccination campaign

- (i) The Committee recommends the preparation, well in advance, of family-wise birth and death registers to be maintained for each village, drawing up of a vaccination programme to ensure ready supplies of lymph so as to facilitate uninterrupted work of the Vaccinators, and making arrangements for recording the results of vaccinations.

- (11) The Committee further recommends that, while the newly recruited Vaccinators should do vaccination work, the existing trained vaccinating staff of each State should be entrusted with the task of supervising the Vaccinators' work and recording results of vaccination

(13) Health Education

The Committee recommends that preparations for health education of the people should be taken in hand as soon as the principle of the eradication programme is accepted, and education of the population should be carried out with increasing tempo so that the people are fully ready to receive the programme when it is launched

(14) Formation of Anti-Epidemic Committees at the District level

The Committee wholeheartedly supports the idea of formation of District Anti-Epidemic Committees

(15) Pilot Projects

The Committee recommends that, in order to estimate the requirements of the eradication programme in respect of manpower and finances, each State should institute a pilot project for this purpose in an area with a total population of not less than 60,000

(16) Epidemiological Units

The Committee recommends the formation of an Epidemiological Unit in each State for the continuous study of the smallpox problem

(17) Organisation of the Vaccination Campaign

In order to ensure the success of the campaign as envisaged, the Committee recommends that a suitable administrative machinery should be created at the District and State level, as well as in the Central Ministry of Health, with adequate powers to deal effectively with the day-to-day administrative problems and take decisions on any matter concerning the campaign "

In implementing the recommendation of the Committee in regard to setting up of smallpox pilot projects the Government of India financed during 1960-61 sixteen pilot projects, fifteen in the constituent States of

the Union and one in the Union territory of Delhi. These projects were brought to a close on 31-3-1961. The chief lessons learnt from them are as follows :

1. Easier methods should be devised whereby procedural delays in obtaining financial sanctions for purchase of equipment and recruitment of personnel may be minimised.
2. A thorough training of the individuals recruited to serve as vaccinators is an unavoidable necessity. It became painfully obvious during the course of pilot projects that the training of vaccinators had been very defective. Not only were a large number seen following faulty techniques of vaccination, but they were also found to be woefully lacking in the knowledge of asepsis. Thorough training of vaccinators is, therefore, a primary need if the eradication programme is to achieve the desired goal.
3. Inspection of vaccinations and interpretation of the results of vaccination require to be more carefully done so that reliable records of the achievements of the vaccination programme may become available.

Many other experiences have been gained in the pilot projects and these will all have to be fully utilised when the smallpox eradication programme is launched. The detailed report of the Smallpox Pilot Projects Committee, shortly to be submitted to Government, will give full information about these projects.

We have to keep in view the fact that, in spite of our knowledge of the efficacy of vaccine lymph as a prophylactic against smallpox, and in spite of continuing vaccination effort throughout the country for over a century, we have not been able to show any substantial results ; and yet limited local experience as well as experiences of other countries show that an organised effort does yield results. It is time, therefore, that steps are taken to deal with smallpox in a firm manner, making full preliminary arrangements, such as recruitment and training of personnel, obtaining of equipment, manufacture of adequate quantities of lymph, etc., before starting the actual vaccination operations.

In order to produce herd immunity and to keep the population fully immunised, the vaccination programme must be carried out within a short period of years taking care to see that the newborns are vaccinated within 6 months after birth ; thereafter the surveillance services should be established to take care of the sporadic cases that may occur now and again.

We understand that the Smallpox Eradication Programme figures in the III Five Year Plan. We cannot emphasise too strongly the urgency of the problem because apart from the preventable mortality and morbidity resulting from the disease, the continuance of smallpox in this country adds little to our credit in the international field. It also needs to be pointed out that in a programme of this nature uniformity and simultaneity of action throughout the length and breadth of the country are absolutely essential. In order to prevent the possibility of the programme becoming infructuous on account of the lagging behind by one or more States, steps should be taken to ensure that the eradication programme is pushed through on a co-ordinated basis under the direction of a central authority. We have no doubt, that with the valuable experience gained as the result of the pilot projects and with proper organisation and adequate finances, it should be possible to eradicate smallpox from the country within the course of the next few years.

We would like to draw attention particularly to the need for developing the manufacture of freeze-dried vaccine on a large scale. While the replacement of the conventional vaccine for some time to come cannot be contemplated nor would it appear to be absolutely necessary, considering that large areas of the country are difficult of access and that communications break down, there is a sizable scope for the use of freeze-dried vaccine in considerable parts of the country. Gifts of freeze-dried vaccine, we understand, have been received from some countries and more have been promised. While these may be utilised as best as possible in the projected eradication programme, we feel that the production of the freeze-dried vaccine within the country should be accelerated so as to meet our own needs of the vaccine in the dry form. Once the mass eradication phase of the programme has been completed, the installed production capacity of one or two plants should be adequate to meet the needs of the country for the maintenance phase.

(7) CHOLERA

India has been having visitations of cholera for centuries. It is a communicable disease, endemic in certain parts, with a tendency to breaking out in epidemics in others. It is preventable, but its prevention would involve a stupendous expenditure of money in order to provide safe and potable water throughout the length and breadth of India and also to arrange for appropriate environmental sanitation, so that the disease may be denied its usual means of spread. Sporadic occurrences can then be controlled by appropriate preventive measures including immunisation of the threatened population with cholera vaccine.

In order to show the magnitude of the problem of cholera, figures taken from the Bhore Committee's report are given below, and they show

a wide range of variation in the incidence of the disease from quinquennium to quinquennium.

The figures for British India (excluding Burma) were :

Period	Annual average	Period	Annual average
1877-81	288,949	1912-16	328,593
1882-86	286,105	1917-21	392,070
1887-91	400,934	1922-26	143,890
1892-96	443,890	1927-31	297,756
1897-01	383,294	1932-36	140,440
1902-06	367,160	1937-41	147,423
1907-11	397,127		

The position in regard to the incidence of this disease since the publication of the Bhole Committee's report in 1946 has hardly changed ; the morbidity and mortality it has been causing in the recent past are given in the subjoined table. What has been said about cholera in 1946 holds good to the present day.

Incidence of Cholera in India

Year	Attacks	Deaths
1948	—	—
1949	—	—
1950	1,32,357	1,00,373
1951	72,838	46,228
1952	81,174	50,578
1953	1,57,392	83,492
1954	23,891	13,222
1955	22,734	11,466
1956	43,418	24,162
1957	62,411	46,442

The above figures, which pertain to twelve States, viz., Andhra Pradesh, Assam, Bihar, Bombay, Kerala, Madras, Mysore, Orissa, Punjab, Rajasthan, Uttar Pradesh and West Bengal are incomplete. Figures pertaining to some States are not available.

The above table shows a high case mortality which is probably the result of inadequate facilities for early treatment. The study of figures

statewise shows that the incidence of cholera is of considerable magnitude in West Bengal, Bihar, Uttar Pradesh, Orissa, Andhra Pradesh, Madhya Pradesh, Bombay, Madras and Mysore, and that the disease occurs mostly in the second half of the year unlike smallpox which is most prevalent in the first half of the year.

The disease has relentlessly continued to claim a large number of lives annually. As a result of investigations carried out recently, it has been found that the areas demarcated earlier by workers as endemic areas still continue to remain endemic. Areas of high endemicity, as accepted today, are :

1. The main area which lies in the very extensive Ganges-Brahmaputra delta in West Bengal.
2. An area which is a horn-like extension of the Bengal area, in Assam along the Brahmaputra river.
3. Inland areas which lie in the Ganges basin in Bihar and Uttar Pradesh. They are situated in the deltas of the rivers Kosi, Gandak, Sone, Gogra and Gomti where they join the Ganges in deltaic fashion.
4. Area formed by the estuaries of the three rivers of Orissa, namely the Barbalang, the Swarnarekha and the Mahanadi, and the Chilka Lake, and
5. The deltaic areas of the Godavari, the Krishna and the Cauvery which form three distinct foci of infection in the South.

Cholera has been posing problems for a long time and epidemics, which are known to have been occurring since time immemorial, have given India the unenviable reputation of being called the 'home of cholera'. While many countries have eradicated this disease from their territories, India has yet to make a start in that direction.

The Government of India appointed an Expert Committee in the year 1958 to review the question of Cholera and recommend ways and means to deal with it. That Committee made some interesting observations which deserve notice. As regards the factors influencing endemicity and epidemicity of cholera, the Committee states :

"The factors responsible for persistence of infection in endemic areas are not yet fully understood. This matter has been the subject of intensive investigation for several years."

"The problem of primary importance in the epidemiology of cholera is the existence of areas in which cholera is per-

manently present. These endemic centres form a menace to adjoining areas for which they constitute a continuous reservoir of infection and their existence also necessitates quarantine supervision for the protection of countries to which infection may be carried by sea."

"Over the greater part of India cholera only occurs in epidemic waves at intervals and infection does not persist from one season to the next. A re-introduction of infection at a favourable season is necessary to start an epidemic and the primary source of infection is the endemic area. The cholera problem in India is consequently that of the endemic areas whose existence constitutes a permanent threat to the rest of the country."

A careful study of the epidemic during the years 1957 to 1959 made by the Committee revealed certain important features regarding the spread of the disease, viz.

"(i) that the disease spreads from one area to another in a geographic contiguity and (ii) that the appearance of cases in non-endemic areas depends entirely on the extent and intensity of infection in the neighbouring endemic zones, thereby indicating that the occurrence of cases in the former is triggered off by the infection lurking in the endemic zone."

Thus, according to the Expert Committee, the disease appears to spread from West Bengal to Bihar and Uttar Pradesh and thence to Orissa, and from Orissa in two directions, towards the east and the regions in the South. As the disease spreads, subsidiary centres of infection are formed from which it spreads radially to the surrounding areas. These observations have an important bearing on the problem of control of cholera throughout the country.

After a detailed examination of the problem of cholera as it confronts the country to-day, the Expert Committee recommended remedial measures for application in the endemic and epidemic areas. Emphasis has been laid on the need for concentrated efforts to control cholera in the key areas of endemicity. In these areas, the infection is present almost continuously, and it spreads from there to other parts of the country. An all-out effort is, therefore, necessary to eradicate the disease from these areas. The measures recommended include improvement in environmental sanitation, with provision of sample supplies of safe drinking water on a permanent basis,

Other routine measures, such as the use of cholera vaccine, disinfection of water supplied, etc. are also to be utilised. Above all, a target date requires to be fixed by which the eradication programme should be completed.

The Committee further recommended, for reasons already stated, that the eradication programme should be undertaken, to start with, in West Bengal and Orissa. In West Bengal, it would appear to be necessary to take an area of 500 square miles extending some 10 miles south and 40 miles north of the city of Calcutta. The city of Calcutta forms the major focus of infection. In Orissa, the area around Cuttack and Puri should be covered by the eradication programme. If the measures mentioned above are applied to the two key areas of West Bengal and Orissa, it would be reasonable to assume that the total picture of cholera in the rest of the country will be materially altered thereafter for the better.

The Expert Committee emphasised the need for inter-departmental coordination so that the Public Health Engineering Organisations and Health Directorates of the States function in full co-operation in carrying out water supply and sanitation programmes on a priority basis in areas found to be having outbreaks of cholera.

The need for establishment of 'Epidemiological Units' to conduct epidemiological studies in order to discover foci of infection so as to prevent the dissemination of the disease has been stressed. Such units will have to carry out continuous studies of cholera problems, determine specific areas from which the infection spreads to other areas, study the role of fairs and festivals in the dissemination of infection, study the role of different modes of transport, e.g., road, rail and river, in the dissemination of infection, develop suitable techniques for early recognition of cases and make periodical reports to the Central Ministry of Health and to the Headquarters of the States to alert them in regard to threats of spread of infection.

In regard to the control measures recommended for areas where epidemics of cholera break out, the Expert Committee emphasised the need for enacting legal provisions for ensuring prompt action in fighting epidemics of cholera. While legal provisions are in existence in the States for application in case of need, it would appear to be advisable to have all-India legislation which could be made applicable in all the States with appropriate changes necessitated by local conditions,

The Expert Committee pointed out the importance of early detection and notification of cases of cholera, and recommended that a reliable machinery be established to perform these tasks. The present system of notification is unsatisfactory and full of imperfection.

The Committee dealt with the technical aspects of cholera vaccine prophylaxis in great detail. While admittedly cholera vaccine is very helpful in the control of epidemics the immunity conferred by it is of a short duration, lasting for about six months. In respect of strains of cholera vibrios for the manufacture of cholera vaccine, and potency tests on vaccine, the Committee recommended that, in order to obtain a standard vaccine, one centre should be established in India for the purpose of distributing suitable strains of cholera vibrios to the laboratories producing vaccine, determining potency of vaccine produced by these laboratories, and distributing diagnostic sera for use by the public health authorities.

In respect of supply, storage and distribution of vaccine, the Committee stated that at present vaccine is manufactured at eleven centres in the country and suggested that all those States, which have no facilities for manufacturing large quantities of vaccine, should take steps to increase their production. For emergency use, adequate stocks of vaccine should be maintained at district headquarters and in the subsidiary depots at thana headquarters.

For disinfection of water supplies, the Committee recommended chlorination. That is the most efficient, inexpensive, reliable and simple method of destroying the common pathogenic organisms in water.

These and other recommendations of the Committee in respect of disinfection of cholera discharges, appointment of anti-epidemic committees, spread of health education and prosecution of further research in cholera offer reliable means for dealing with the disease. In regard to further research the Committee added that there are still several basic aspects of the problem of cholera which require to be elucidated. For example, it says that it is well known that cholera breaks out *de novo* in some areas and yet the manner in which the infection persists in such areas during inter-epidemic periods is not fully understood.

About the treatment of cholera, it has been stated that in spite of repeated attempts, no significant advance has been made in the treatment of cholera since the introduction of hypertonic saline therapy by Rogers in the management of suitable cases. The newly found chemotherapeutic drugs and antibiotics have not been found useful as specifics in the treatment of the disease, although sulpha drugs are known to be helpful in destroying the cholera organisms in the bowel. Further research into these and many other aspects of the cholera problem is called for. An extract from the report of the Expert Committee in this connection is given below :—

‘It is thus obvious that there is need for further research into many facets of the problem of cholera. The epidemiological units already recommended by the Committee will no doubt throw light on some of the problems listed above. Their work will embrace research in the field. Here specific mention is being made of the need for further laboratory research. This question has been engaging the attention of the Cholera Advisory Committee of the Indian Council of Medical Research which has recommended the establishment of a permanent unit, with full-time staff, for the purpose of continuing research on this vexing problem. It is considered essential that this recommendation is given effect to immediately. Some of the items of work, to which a unit of this nature would devote time, would be :—

- (a) A complete investigation of cases of cholera and gastro-enteritis from clinical, bacteriological, immunological, metabolic and biochemical aspects.
- (b) Evolving practical methods for assessing immunity levels in population groups.
- (c) Investigation of the role of intestinal viruses as predisposing factors in the causation of cholera.
- (d) Determination of the role, if any, of cholera-like vibrios in the pathogenesis of the disease in different parts of the country.
- (e) Determination of the utility of tissue culture techniques in studies on cholera.
- (f) Attempts at transmission of infection to laboratory animals to facilitate studies visualised above.

- (g) Attempts at improvement of the present cholera vaccine with a view to increasing the duration of immunity conferred by it.

"In view of the ready availability of material the Committee recommends that such a unit be established in Calcutta."

Recommendations :

We are in general agreement with the recommendations made by the Expert Committee on Cholera, and we believe that, with the implementation of the programme recommended by the Committee, India will be able to control this communicable disease. We have already drawn attention to the need for taking intensive measures in West Bengal area for the control of the disease, that area being the most important focus of infection in the country. We understand that the Government of West Bengal have already initiated action in this matter, particularly in respect of providing safe water-supply and proper drainage in the Greater Calcutta area and mass immunisation of the population with cholera vaccine during the next five years. As stated earlier, the expenditure will be very high, but that high investment will pay dividends in the shape of saving human life, reducing loss of working hours and manpower and keeping the population free from this scourge.

(8) TRACHOMA

Introduction :

The fact that a large percentage of world's population suffers from trachoma emphasises the global importance of this problem. It is stated that in many countries like Africa, Middle East, South-East Asia, etc., this disease is the major cause of blindness. Taking advantage of the recent discoveries of broad spectrum antibiotics, several countries in the world have started control programmes, some on a mass scale. We are glad to note that this problem has received considerable attention in India during recent years. In view of the extensive disability and blindness caused by the corneal and lid complications of trachoma and associated conjunctival infections, the Indian Council of Medical Research convened a meeting of the leading Ophthalmologists of India at Baroda in 1954. Based on the recommendations of this Committee, in which an expert of the World Health Organisation also participated, the Government of India launched a Trachoma Pilot Project in July, 1956.

Trachoma Pilot Project :

The main objectives of this Government-sponsored project are to define the extent of the problem in the various States in the country, to

determine the role played by the various epidemiological factors and to develop effective, economically feasible measures for the control of the disease. Training of medical and para-medical personnel and development of suitable health education programmes directed towards control of communicable eye diseases also formed part of this project. It may not be out of place to review briefly the salient achievements of this project.

The project was established at the Gandhi Eye Hospital and the Muslim University Institute of Ophthalmology, Aligarh, under the administrative control of the Indian Council of Medical Research. The World Health Organisation contributed technical assistance and the U.N.I.C.E.F. provided the necessary equipment, drugs, vehicles, etc.

Surveys for the prevalence of trachoma were carried out by the project according to a sound statistical procedure, covering as far as possible every district of each of the 15 States in the country. To elucidate the role played by the various contributory factors and other epidemiological characteristics of the disease, an intensive study was undertaken in a group of 29 villages in western Uttar Pradesh, five of which were submitted to a longitudinal study for one year. To ensure uniformity, the staff recruited for the surveys was given preliminary training on all aspects of the problem.

Extent of the Problem :

Based on the results of the surveys, it has been possible to work out in detail the prevalence rates of this disease in various States of the country (vide map at Appendix C. 8). In the northern and north-western States (Rajasthan, Punjab, Uttar Pradesh, Gujarat, Bihar and Madhya Pradesh), the prevalence rate of trachoma (stages 1 to 4) is very high, ranging between 35 to 78 per cent. There is no doubt that in these States the disease constitutes a major public health problem. In the remaining States, though the overall prevalence is of the magnitude of 25% only, pockets of high endemicity have been found to exist particularly in Mysore, Assam, Jammu and Kashmir.

Attempts to bring out the extent of visual impairment brought about by trachoma and associated bacterial infections revealed that 12% to 42% of the population examined were 'economically blind'. For the purposes of this study, 'economical blindness' was taken to be that degree of visual impairment as a result of which the person could not count fingers at a distance of two meters with both eyes open. In the course of the study it was also found that for every economically blind person there were five who suffered from mild or moderate degree of visual impairment. According to this assessment, it would appear that,

based on the 1951 census of the rural population, there would be about 450,000 economically blind persons in the country solely due to trachoma and associated infections. If mild or moderate degrees of visual impairment were also to be taken into account, the total number so affected would amount to 2.7 million.

Epidemiological Characteristics :

The intensive epidemiological studies, though confined to relatively small areas of western Uttar Pradesh, brought to light certain important findings. Firstly, 85% of the population examined revealed signs of active or healed trachoma. The disease was usually of either moderate or severe intensity, the latter being more common in women. The age of onset was between 1 and 3 years and the chief victims of active trachoma were children under 10 years of age. Sub-acute and acute bacterial conjunctivitis complicating trachoma was encountered frequently among children especially those under two years of age. Incidence of active trachoma as well as bacterial conjunctivitis increased markedly during March/April and again during July/September. The higher temperature, rainfall and the concomitant increase in the fly population in the above periods were perhaps partly responsible for the peak incidence of active trachoma and associated bacterial conjunctivitis. An observation of particular importance is that these diseases were more prevalent in communities with low standards of personal and environmental hygiene. These studies have thus been of extreme importance in indicating the lines along which the control measures should be developed. The age and sex groups more prone to this disease, the socioeconomic groups among whom it is common and the seasons during which the control measures have to be vigorously undertaken are all clearly defined.

Treatment Trials :

Trials undertaken with tetracycline group of antibiotics (tetracycline and chlortetracycline) on continuous and short-term intermittent schedules revealed that the latter regime is most suitable taking into consideration the incidence of relapses and re-infections, the cost involved, etc. During the course of this study, the extent of co-operation available from the parents and/or school teachers in carrying out the treatment has also been evaluated. Based on the experience gained in the above therapeutic trials, similar studies have been extended to larger areas (Community Development Blocks) in order to find out the feasibility of application of this method as a public health measure. Activities directed towards the control of trachoma have thus been initiated on a small scale in seven States of the country.

Recommendations :

On the basis of the results already in hand, we feel that enough information has been gained on the extent of the problem in the country as a whole, the effective lines of treatment for the control of the disease, the antibiotic requirements, the number and type of personnel needed to enable institution of mass control programmes, at least in the near future.

Taking into account the results of the country-wide studies conducted during the last five years and the efforts already initiated for the control of this disease it is our considered opinion that instead of tackling the problem piecemeal, a comprehensive approach may be made to extend the control activities especially in those States of heavy endemicity where trachoma is shown to be a serious public health problem.

(9) VENEREAL DISEASES

Venereal diseases constitute a sizable public health problem in the country. The diseases affect the Nation's health and produce a great waste of manpower, both in industry and agriculture. They also produce considerable human suffering. Syphilis is responsible for many neo-natal deaths, mental diseases and serious cardio-vascular diseases which may sometimes be fatal.

The percentage of positive reactors to syphilis in surveys conducted at Madras, Calcutta, etc. among apparently healthy people, expectant mothers, varies from 5 to 8, which means 5,000 to 8,000 per 100,000 in the adult population have suffered or are suffering from the disease. With the expected increased tempo of industrialisation, venereal diseases, particularly syphilis, will pose even more serious problems.

Bhore Committee Recommendations :

The Bhore Committee, while appreciating the need for organising a campaign against venereal diseases and while considering that it would not be desirable to introduce compulsory notification, recommended the following :—

- (a) Free treatment to all patients seeking such treatment, through clinics in association with hospitals and dispensaries at all levels,
- (b) Facilities, without payment of fees, for personal prophylaxis,
- (c) Adequate diagnostic facilities,
- (d) The creation and maintenance of a follow-up service, and
- (e) Education of the people in regard to the spread and control of venereal disease.

Measures designed to discourage promiscuity and prostitution were also considered essential.

The Committee also recommended a special organisation for dealing with venereal diseases to be established at the Centre and in each Province as a part of the provincial health department with a Provincial Venereal Disease Officer and necessary staff.

The proposed expansion of treatment facilities was to be made possible with the production of a sufficient number of doctors with specialised training. The clinics at the provincial headquarters and such of the clinics in the districts as may be considered suitable should be organised, as soon as possible, to give special training in these diseases. Such training should be made available not only to doctors in public service but also to private practitioners.

Prohibition of treatment of these diseases by all except those who possess registrable medical qualifications, prohibition of advertisements regarding specific remedies and other forms of treatment and measures for health education, sex education, control of prostitutes until cured or at least rendered non-infective, re-education, rehabilitation, and promotion of Voluntary Social Organisations, were other recommendations of the Committee on this subject.

Progress Made :

The main activities in this field, since the Bhore Committee report, comprise :—

- (1) Mass treatment and survey campaign by the W.H.O. V.D. Demonstration Team in 1949 in Himachal Pradesh,
- (2) Upgrading of the V. D. Department of the Madras General Hospital to a post-graduate Institute for a diploma course in V. D. (D.V.) in 1952,
- (3) Establishment of a Penicillin Production Unit (Hindustan Antibiotics Ltd., Pimpri, Poona) in 1952,
- (4) Establishment of a Cardiolipin Antigen Production Unit, at Calcutta, in 1954,
- (5) Establishment of a V.D. Training Centre at Safdarjung Hospital, New Delhi, in 1954,

- (6) Establishment of 95 district and 5 headquarter clinics,
- (7) The passing of the Drugs and Magic Remedies Act, 1954,
- (8) The passing of the Suppression of Immoral Traffic in Girls and Women Act, 1956,
- (9) The establishment of a Central V.D. Organisation with a V.D. Adviser to the Government of India, and
- (10) Constitution of a Central Advisory Committee on V.D. under the chairmanship of the Director-General of Health Services.

The Antigen Production Unit has been able to supply all demands of Cardiolipin antigen since 1956. The supply has been free.

Even though the Penicillin Production Unit was established in 1954, the required quality of PAM (Penicillin) has not yet been available from that source. This has slowed down the progress of the V.D. and Yaws programmes.

The V.D. Demonstration Unit which was established in 1949 with the assistance of W.H.O. in Simla carried out extensive survey and mass treatment programmes in the hilly regions of Himachal Pradesh where the detection rate of seropositivity varied from 5% to 50%.

In December 1951, the WHO Team was withdrawn and the entire V.D. work was taken up by the Himachal Pradesh Administration and this was included in their Medical and Public Health programmes. Considerable expansion of the activities has taken place in recent years as a result of which the number of clinics in Himachal Pradesh has been increased to 20.

A scheme for an intensive V.D. Campaign was also launched in 1958 in the District of Mahasu, one of the worst affected areas (average positivity rate 25%). The figures in respect of the people examined and treated are given below :—

Total examined up to end of 1960 : 5.75 lakhs.

Total treated up to end of 1960 : .75 lakhs.

A definite downward trend in syphilis incidence in the area has been reported.

The Central V.D. Organisation with an Adviser in V.D. was established in November, 1957 in the Directorate-General of Health Services.

In the States of Himachal Pradesh, West Bengal and Andhra Pradesh, there are State V.D. Control Officers. In other States, one of the senior Assistant Directors looks after V.D. Control work.

The V.D. Training and Demonstration Centre was established in March, 1954 at Safdarjung Hospital, New Delhi. This has also an attached serological Laboratory. Besides providing up-to-date facilities for the diagnosis and treatment of venereal diseases, this centre also affords refresher courses for Venereal Diseases to workers from the different States in India.

There is an increasing demand for the training facilities offered in this institution. Besides training V. D. workers, the Centre gives short courses of training in V.D. to Nursing and Lady Health Visitor trainees also.

The upgraded V.D. Institute of the General Hospital, Madras, caters both for post-graduate diploma course and refresher courses in venereal diseases. The total number of people trained from 1953 to 1960 (all categories) are :—

V. D. Institute, Madras				
Diploma Course	..	..	..	36
Refresher Course	..	..	..	64
V. D. Training and Demonstration Centre,				
New Delhi	..	..	..	119

In the Serological Laboratory of the former Institute, research work with regard to V.D. problems is also conducted.

Other measures include :

A short term intensive mass V.D. campaign based on 'blanket treatment' of the entire population at risk in the Kulu Valley of Punjab State. This is an area with high prevalence of syphilis. A mass survey was carried out in September, 1959.

Again a re-survey in Kulu Valley was carried out in September, 1960. The results of these two surveys are given below :

District-wise				1959	1960
Banjar	..	..	..	14%	12%
Anni	..	..	..	18%	13%
Naggar	..	..	..	22%	14%
Boosh	..	..	..	12%	10%

A similar intensive mass campaign was also carried out by the Uttar Pradesh State in the Jaunsar Bawar Area.

The Social and Moral Hygiene Association of India have opened recently a V.D. Clinic in Delhi. This has been assisted with training facilities for the workers and an initial supply of penicillin (PAM).

The Drugs and Magic Remedies (Objectionable Advertisement) Act, 1954, has provided *inter alia* for prohibition of persons taking any part in the publication of any advertisement referring to any drug in terms which suggest or are calculated to lead to the use of that drug for the diagnosis, cure, mitigation, treatment or prevention of any venereal disease.

The Government of India ratified in 1954 the Brussels Agreement (1925) concerning facilities to Merchant Seamen for treatment of venereal diseases. Information collected from the major ports shows that only a small number of Venereal Diseases cases attend the clinics at these ports.

International assistance in Venereal Diseases Control Programme has come from the specialised agencies of the United Nations, viz., World Health Organisation and UNICEF. In 1949 the World Health Organisation set up a Venereal Diseases Demonstration Centre in Simla in association with the Government of India and Himachal Pradesh Administration for conducting mass surveys and treatment programmes besides giving training to Venereal Diseases teams from the whole of South-East Asia Region. This approach to Venereal Diseases problem has paved the way for further expansion of Venereal Diseases Control activities in Himachal Pradesh and other parts of the country. During its functioning most of the specialised equipment and a considerable share of the expenses of penicillin (PAM) were borne by World Health Organisation. In 1949 a World Health Organisation consultant toured the country at the request of the Government of India and submitted a report on the programme for Venereal Diseases Control in India. Other assistance rendered subsequently by World Health Organisation was to provide a Serologist and a Public Health Nurse for a short term period of 1 year to the Madras Venereal Diseases Institute.

Seventeen teams from India were trained at the Venereal Diseases Unit in Simla and as per agreement those teams were supplied free field-sets of serological equipment by the United Nations International Children's Emergency Fund on the advice of World Health Organisation. This assistance has been of help in establishing the nucleus of Venereal Diseases Units in some of the States. The United Nations International Children's Emergency Fund also supplied up to the end of

1957, free penicillin (PAM) for treatment of venereal diseases in women and children attending these clinics.

Both the Penicillin Production Unit at Pimpri (Poona) and the Antigen Unit at Calcutta have been established with World Health Organisation/United Nations International Children's Emergency Fund assistance.

The World Health Organisation and Technical Co-operation Mission have been granting fellowships for study in Venereal Diseases abroad.

To achieve uniformity in the techniques of S.T.S., it is proposed to upgrade the Venereal Diseases Laboratory at Madras into a Central Serological Venereal Diseases Reference Laboratory. This will conduct periodical inter-laboratory evaluation tests.

Recommendations :

The control of venereal diseases poses special problems unlike other communicable diseases. There are no intermediary insect vectors to fight with, no immunising agent for mass application and these diseases are linked up with the basic instincts of man. The tendency to hide them because of special stigma is great. Social evils like prostitution account for their spread. Socio-economic factors also play a great part in their perpetuation and dissemination.

Against these formidable barriers some recent advances in their diagnosis and treatment have opened more practical ways of combating these diseases. For example treatment with antibiotics PAM (Penicillin) is effective, economical, less hazardous and less time-consuming than the previous methods. New techniques in case-finding methods have also been developed. Prevention of congenital syphilis could be achieved by the timely use of modern antibiotic therapy in pregnant women.

Compulsory notification may not be an effective step in this country yet. The trends in incidence and prevalence may be assessed by indirect methods. Though not completely informative, one way would be to get proper monthly returns from all the States on the different types of venereal diseases treated in all institutions in a prescribed proforma. Serological surveys in selected groups of population, random sampling in highly endemic areas, serological testing of all pregnant women are some of the other sources of such information. These will have to be carried out more extensively than hitherto.

The measures to discourage prostitution and promiscuity should be taken up by social welfare agencies and Health Education Sections of the Health Services.

In the control measures it is extremely important to have family contacts brought in for testing and treatment. This will be the duty of Social Workers/Health Visitors or other contact-tracing staff. For the initial diagnosis and appropriate treatment, clinical services are preferable. Ordinarily the question of a domiciliary service as in tuberculosis, therefore, does not arise in syphilis control. Also the results achieved will not be commensurate with the heavy expenses involved.

A National Venereal Diseases Control programme should be a partnership between the Centre and States. As it develops in the successive Five Year Plans more and more co-operation should be sought from the voluntary social agencies wherever they exist. The long-term objective should be to reduce the incidence of these diseases to a negligible proportion and bring them down to a minor, easily manageable public health problem eventually leading to eradication. This will demand sustained efforts, based on successive Five Year Plan programmes for at least the next 20 to 25 years. Greater use will have to be made of epidemiological methods. This is particularly so in the case of infectious stages of syphilis and gonorrhoea. The speed with which contacts are traced, located and brought to treatment will need stepping up and this will be a major aspect in the future control plans.

Unfortunately there is still a misplaced and unwarranted feeling among medical and lay people that with the advent of penicillin, syphilis and other venereal diseases have become 'dying diseases'. While an initial post-war downward trend in the venereal diseases in the world at large was reported, it is too early to take such reports seriously. On the other hand some recent reports indicate the same if not higher levels of incidence in U.K. and U.S.A., especially among the teenagers. In the United States there was actually an increase in the number of cases of syphilis in 1956 and 1957 and many cases treated by private physicians or remaining undiagnosed are undoubtedly not being recorded.

There is need to insist on the need for reinforcing venereal disease control programmes including more emphasis on the availability of free treatment facilities in 'strategic areas' and on epidemiological case-finding and systematic serological examinations, and above all, health education of the public and the use of public information services to make people more conscious of the still present dangers of venereal diseases and their continued presence in large segments of the population.

In the long-term approach to the control of these diseases the essentials are therefore to continue and expand systematic programmes on all the three fronts, viz. therapeutic, educational and epidemiological with periodical assessment of the results achieved with such modifica-

tions in the programmes as may become necessary from time to time for a period of at least 20-25 years.

The Venereal Disease control programme should be organised :—

- (a) To further integrate within the existing public health services both preventive and curative aspects,
- (b) To discover and treat all infectious cases in order to break the chain of transmission in areas of high prevalence,
- (c) To provide additional treatment and diagnostic facilities in the country following modern accepted procedures,
- (d) To improve the epidemiological activities and health educational programmes,
- (e) To give priority to the treatment of pregnant women with a view to prevent congenital syphilis, and
- (f) To have a more comprehensive and detailed morbidity study of V.D. in the country.

In order to achieve the above objectives, the following steps are recommended :—

- (1) Free supply of penicillin (PAM) to all the Venereal Diseases Units.
- (2) Free supply of antigens to Venereal Diseases Units with attached serological laboratories.
- (3) Continued assistance for training programmes and for strengthening Maternity and Child Welfare Health Units for carrying out routine ante-natal serological testing of pregnant women and treatment of positive cases.
- (4) Continuation of mass campaigns in Himachal Pradesh and additional mass campaigns in the Tehri Gharwal areas of U.P. and in selected industrial areas of large cities.
- (5) Expansion and strengthening of the existing Training and Demonstration Centres and the establishment of new training centres at Bombay, Calcutta, etc.
- (6) Adequate provision for health education activities in respect of Venereal Diseases.
- (7) Provision for financial assistance to recognised voluntary agencies in the field of Venereal Diseases control.
- (8) Establishment and expansion of a Central Venereal Diseases Reference Laboratory at Madras and Regional Reference

Laboratory each at Bombay, Calcutta and Delhi attached to the Training Centres. Assistance for Fellowships and equipment for these may be requested from WHO/UNICEF.

- (9) Provision for further research and manufacture of diagnostic agents like Frei's antigen at the Antigen Production Unit, Calcutta.
- (10) Provision for the improvement of facilities at the major Sea Ports for the treatment of Venereal Diseases among sea-farers.
- (11) *Incorporation of training in Venereal Diseases in the training programmes of Medical Officers for Primary Health Units and*
- (12) Adequate remuneration for people taking up the speciality of venereal diseases.

Yaws :

Yaws, a non-venereal treponemal disease, according to information available at present is a public health problem in the contiguous areas of four States, viz. Madhya Pradesh, Andhra Pradesh, Orissa and Bombay (Chanda district).

The exact number of the population at risk is not known. It is estimated that 3% to 15% is the prevalence rate in the aforesaid areas. The disease is particularly prevalent among the backward classes and those living in the tribal areas. The disease is contracted mostly in childhood. The disabling lesions of the disease affect the working potential and agricultural production of the community.

Yaws is an easily controllable communicable disease. Eventual eradication is also possible.

The anti-yaws programme in the country was started in the three States of Madhya Pradesh, Andhra Pradesh and Orissa.

Information on Yaws control activities in the different States is given below :

States	Total No. of cases at risk	Year of commencement	Total No. of cases treated
Maharashtra	19.2 lacs	December 1960	N. A.
Andhra Pradesh	16.4 "	" 1953	67,364
Madhya Pradesh	21.0 "	" 1952	74,109
Orissa	30.0 "	" 1956	17,401

The long-term objective is eradication, for which consolidation of the gains achieved during the initial treatment survey is necessary.

Both re-survey and constant vigilance will have to be carried out by existing health units as part of their overall public health activities. This will prevent resurgence of the disease from where it has been eradicated. There is also need for raising the socio-economic level of the population in the area.

Surveys in other parts of the country may help detection of undiscovered incidence of yaws in fresh areas.

The control of yaws should also be vested in the State Venereal Diseases Control Officers.

(10) PLAGUE

While reviewing the problem of plague in India, the Bhole Committee highlighted the gradual decline in the plague mortality in the early decades of this century. Deaths due to plague around 1940 constituted 3% or less of the total deaths in India. However, with the extensive application of DDT spraying as a part of the National Malaria Eradication Programme instituted after Independence, human plague in India has virtually disappeared and it is no longer considered a public health problem today. With few exceptions, no cases of human plague were reported even from once endemic regions of the country at least since 1952.

Some of the observations made in the last 10 to 12 years have, however, brought to light certain disquieting features. Sylvatic plague still smoulders in the dry and sloping regions of Uttar Pradesh, particularly Garhwal and Kumaon regions. During recent years there have been reports that plague infection has been introduced into Assam. Sporadic cases of human plague are said to have been encountered in the last two years from a contiguous area covering the taluk of Hosur in Madras State and the taluk of Malur in Mysore State. Observations are also on record that the fleas, concerned in the transmission of plague, are gradually developing resistance to DDT. The fact that human plague occurred in the above contiguous areas of the States of Madras and Mysore, even after extensive DDT spraying operations, lends further support to this observation. Yet another disturbing finding is the evidence brought forth recently of changes in rat population. It has been reported that in Bombay, *B. Bengalensis* which is highly sensitive to plague infection, is gradually replacing *R. Norvegicus*, a more resistant species. Such shifts in rat population can be expected to create favourable conditions for triggering off epidemics in the human beings.

In view of what is stated above we feel that there is good deal of evidence indicating the need for caution and we should not develop an attitude of complacency. The public health departments of the States where clandestine infection is persistent should be continuously alert to the possibility of outbreaks of human cases. In the potentially dangerous areas, rat elimination measures should be undertaken on a priority basis. Vigilance, in order to assess from time to time the general situation and the factors involved in the preservation and propagation of the disease, is also necessary. We recommend that epidemiological units proposed in the State Health Directorates should arrogate these functions to themselves.

(11) VIRUS DISEASES

Introduction :

Virus diseases have assumed increasing importance as one of the major causes of morbidity and mortality in the country and a number of epidemics of virus origin have been reported during recent years, e.g. the epidemic of influenza in 1957, epidemic of infectious hepatitis in Delhi during 1955 and epidemics of encephalitis in children in several urban centres. Apart from small-pox, there are other infections current in the communities and some of them, e.g. measles, have also shown increased prevalence in many parts of the country. The picture presented by poliomyelitis is apparently changing rapidly and outbreaks of some severity, both in urban and rural centres, have been reported. Newer virus diseases, particularly those transmitted by insects, e.g. the Japanese B encephalitis and the Kysanur forest disease in South India, have also created, in some instances, problems of major public health importance. Again, with the success of the Malaria Eradication Programme now in operation, many of the febrile diseases, loosely diagnosed as malaria in the past, are likely to prove of virus origin. It is obvious that increasing attention must be paid in the ensuing years to several of the problems of this nature and adequate measures taken for their control and prevention. We will refer in detail to the specific problems created by some of these diseases.

Respiratory virus infections :

Influenza :

Influenza has always been a common respiratory virus infection in all parts of the country. Localized outbreaks of varying intensity also occur periodically. Influenza occasionally assumes pandemic proportions when infection spreads from one part of the world to another with lightening rapidity. India had such pandemics in 1781, 1889, 1918 and

1957. The pandemic of 1918 had affected nearly 70 million or 30% of the population with a high mortality rate ranging from 1% to 50% — average being 10%. The history of the 1957 epidemic is interesting. It had its origin in North China in January of that year. Canton, Hong-kong, Japan and Malaya were affected in turn, and the infection was introduced in India from Singapore to Madras in May, 1957. All parts of the country were subsequently affected and over 5 million cases were reported. The mortality rate was, however, low.

With the discovery of the influenza virus in 1933, many factors concerning the aetiology of the disease have come to light. A number of strains of influenza virus have been isolated designated as A.B.C. & D. While these strains produce the same clinical disease, immunologically they are different and there is no cross protection between one type of infection and another. It would appear that 'A' type of virus is responsible for regional and inter-regional epidemics while the 'B' type causes localized infections — so called endemic influenza.

It has now been ascertained that 'A' type of virus is undergoing continuous antigenic changes. The varieties can apparently arise anywhere in the world and then spread to other regions, causing epidemics and occasionally pandemics.

Influenza is thus a global problem. It is obvious that studies on the antigenic characters of the virus have to be carried out in different parts of the world. Accordingly the W.H.O. set up a World Influenza Centre in London, and a strain study centre in New York, and invited all member countries to co-operate in the international programme by setting up regional laboratories, which would serve as 'listening' posts for furtherance of this effort.

We are glad to note that the Government of India are participating in this programme by establishing a centre in the Pasteur Institute, Coonoor. The important activity of this Centre, since its inception in 1950, has been to study the problem of influenza continuously, isolate strains of virus, determine their antigenic pattern and warn the World Influenza Centre if a new variant of the virus appeared.

Already the Centre has done very useful work. A number of virus strains from material obtained from various regions have been isolated and their biological characters studied. In addition a continuous study of the virus strains prevalent at different times in a selected community is being made in order to report the occurrence of any variants.

This leads us to the consideration of the steps that should be taken for the control of influenza.

It might be mentioned that attempts had been made by the Central and some State Governments to impose quarantine restrictions on passengers arriving by sea and air in order to prevent the introduction of new strains of the virus responsible for the pandemic of influenza. These attempts had failed which is understandable in view of the insidious and very rapid spread of the disease from one country to another. There are practical difficulties in instituting quarantine measures which are also very expensive undertaking. In view of the past experience, we are of the opinion that quarantine measures need not be adopted in dealing with future epidemics of this type.

Attempts have been made in recent years to prepare a vaccine for prophylactic use from the strains considered responsible for the epidemic. Such vaccines, under controlled conditions, have given encouraging results. At the time of pandemic influenza in 1957, the Government of India arranged for the preparation of such vaccines at three centres in the country where facilities for the purpose were available. However, vaccine could not be used in time for it to be of any practical use. Limited controlled trials undertaken with the use of these vaccines, however, had given encouraging results. Unfortunately it is not advisable to keep a stock of such vaccines for use when required. The vaccine has to be prepared from the strains responsible for the epidemic. We are of the view that facilities might be created at different centres for the production of such vaccines at short notice taking into consideration the difficulties that had been encountered in the past in their preparation. We understand that the Pasteur Institute, Coonoor, has developed a suitable method for the manufacture of the vaccine at short notice which is also likely to prove economical. The techniques so developed can be tried elsewhere and an adequate machinery created for ensuring supply of such vaccines, should an emergency again arise in future. It is obvious that even so it would be difficult to provide enough vaccine for the immunisation of the entire population of the country. It is recommended that vaccine should be made available, in the first instance, for the protection of vulnerable groups of the population, such as medical personnel—professional and auxiliary—transport workers, etc. Such a measure will at least help to prevent the dislocation of the civic life of the community.

Adeno-viruses :

Apart from influenza, there are other infections of undeterminable aetiology. There is evidence to suggest that adeno-virus infections are common in the community. Limited observations carried out by the Pasteur Institute, Coonoor, have revealed that such infections in young children may be responsible for much morbidity as over 30% of children

with fever, had antibodies to some of the viruses in this group. This subject obviously merits detailed studies.

Enterovirus Infections :

Poliomyelitis :

Poliomyelitis is endemic in all parts of the country. Statistics about its incidence are not reliable, since the disease is not notifiable. Only during epidemics, the notification is sometimes made compulsory. Poliomyelitis in India is still a disease predominantly of infants, and young children. Majority of cases occur in the age-groups 0 to 5 years and some in the age-group 5 to 10 years. It must be remembered that for every case of paralytic polio, there are at least 1000 cases of non-paralytic poliomyelitis in the age-group 0 to 10 years. Mortality is, however, low.

In recent years, localized epidemics of poliomyelitis, of varying degrees of severity, have occurred in some urban centres in the country, e.g., Bombay, which had a series of outbreaks in 1949, 1952, and 1954. In Andhra Pradesh, in 1960-61, there were over six hundred cases in three districts of the State. The mortality amongst the paralytic cases was about 5 per cent. While such epidemic incidence has not been reported from other areas in the country, the trend towards it is certainly disquieting.

In 1949, following the outbreak in Bombay, the Indian Council of Medical Research established a Polio Research Unit in the Grant Medical College, Bombay, to study the various aspects of the problem. The Centre has gathered very interesting data. It would appear that all the three types of the virus I, II and III are present in the population. However, type I has been responsible for most of the epidemics studied. Nearly 90% of children in the age-group up to 5 years show antibodies to all the three types of the virus and 100% by the age of 10.

These findings demonstrate the wide prevalence of the virus in the community and explain why the incidence of the disease is in the earlier age-groups. However, it must be remembered that as environmental sanitation improves as a result of the country's successive Five Year Plans, the picture will alter materially, and the later age-groups will be affected, unless steps are taken in time to prevent such a development. Already there is evidence to believe that children of higher economic groups do not show antibodies till they attain the age of fifteen years.

With the development of Salk Vaccine in 1954, poliomyelitis can now be regarded as a preventible disease. This vaccine has been used

extensively in many countries, and the results were certainly encouraging. Evidence has now come to light that the immunity produced by it is comparatively of short duration. The course of immunisation is long, and there are practical difficulties in organising with this vaccine a mass immunisation programme.

In 1957, Sabin developed a live oral vaccine using an attenuated strain of the virus. This oral vaccine has been used extensively in many countries in the world and the results have been very encouraging. The vaccine is easy to administer and can be used in the midst of an epidemic. It would appear that Sabin's oral vaccine is the vaccine of choice in organizing mass immunisation programmes in the country.

In the polio epidemic in Andhra Pradesh, it was decided to use Sabin's vaccine as a means of controlling the epidemic. Sufficient quantity of the vaccine to immunise about 100,000 children was obtained from the U.S.S.R. The Indian Council of Medical Research had investigated the outbreak. The Council also organized the mass vaccination programme on scientific lines with full co-operation of the State Government. The vaccine was administered to children in the age-group 2 to 5 years according to approved procedures. Steps have been taken to study the excretion of the live virus in children receiving the vaccine, antibody response in them and such other relevant factors. We await with interest the results of this experiment, which will give, for the first time, data on the behaviour of the vaccine in conditions prevalent in the country on which to base further immunisation programmes. It is obvious that further data will be necessary on the prevalence of the virus types in different areas in the country. It is equally necessary to take steps for the production of oral polio vaccine in centres where facilities are available.

Infectious Hepatitis :

Infectious Hepatitis has now assumed the status of a major public health problem in India and in many other parts of the world. Our knowledge concerning this disease is deficient in many respects. While it has been established that the infection is due to a virus, so far attempts to cultivate it by the usual procedures have not been successful. The epidemiology of the disease is broadly similar to that of other intestinal infections and in India its increased prevalence has been noted during the latter half of the year. While the disease is endemic in many of the urban centres in the country, occasional epidemics of varying degrees of severity have been noted. Some of these epidemics, almost always localised, have been traced to the consumption of water contaminated with the virus. Such episodes have really been many. However, epide-

mics due to the contamination of the central water supply have seldom been reported. Such an occurrence took place in Delhi in November, 1955, and an epidemic of great magnitude broke out due to the heavy contamination of the central water-supply with sewage. Over 20,000 cases of frank disease were reported and almost an equal number with indeterminate symptoms but presumably of the same infection. It is obvious that special steps must be taken to investigate such outbreaks in greater detail in future. There is no specific treatment for the disease. However, it is possible to prevent its occurrence or spread by the use of gamma globulin. Indeed, such a measure was attempted during the Delhi epidemic but it was instituted much too late to permit any evaluation of its efficacy. We are of the opinion that steps should be taken to produce gamma globulin in the country which can be used not only for prophylaxis of these infections but in many others for which suitable vaccines are not yet available.

Epidemic Encephalitis in Children :

There are other diseases due to entero-viruses to which we would like to draw attention. During recent years, epidemics of encephalitis in children have been noted in some parts of India, viz. Jamshedpur, Lucknow, Nagpur, Delhi, etc. It is now generally believed that these infections are due to coxsackie viruses, type A or B. Some of these outbreaks were investigated by the Indian Council of Medical Research, and the Pasteur Institute, Coonoor. While many viral agents have been isolated from the material obtained from such cases, their exact etiological role has not yet been determined. It would appear that many viral agents can cause the symptoms of encephalitis and probably many such agents can operate during an epidemic. The subject is, of course, of great interest and it is essential that appropriate facilities should be created wherever possible for a thorough epidemiological investigation and their virus etiology.

Arthropod-borne Virus Diseases :

There are many types of infections which are now known to be due to viruses transmitted by insects. The symptomatology of these diseases varies considerably ; some produce encephalitis, others hemorrhagic manifestations and many more merely symptoms of general malaise, fever, etc. While numerous studies have been undertaken in many parts of the world on elucidating the etiology of such infections, no attempts have been made in India for a concerted study of the problem posed by these viral agents. We are glad to know that the Virus Research Centre, Poona, established jointly by the Indian Council of Medical Research and the Rockefeller Foundation, has been engaging its attention

to the study of these problems. Preliminary serological investigations carried out by the Centre had indeed revealed the presence of antibodies to several of these viral agents, which are now classified into two main groups—group A and group B. Recently, the Centre had investigated an epidemic of encephalitis in children occurring in the rural parts of Madras State. By the examination of sera from acute and convalescent cases, diagnosis of Japanese B Encephalitis was made and the virus was isolated later from *Culex vishnui* mosquitoes, which were found to breed abundantly in rice fields. This was the first example of an Arthropod-borne virus infection in India. During the last three or four years the Centre had to investigate a form of infection recently noticed in the Kyasanur Forest region of the Mysore State which was responsible for considerable mortality in human beings and monkeys. In human beings, particularly in severe cases, hemorrhagic manifestations such as epistaxis and hematemesis were the prominent features. Ultimately, a virus, belonging to the Russian Spring and Summer Encephalitis group, was isolated and named as Kyasanur Forest Disease Virus.

These findings are of considerable importance. Antibodies to Japanese B Encephalitis have been noted in other parts of the country, while antibodies to KFD virus have been noted in Cutch and in some isolated areas. The Japanese B virus infection is of special importance to India because it is likely to cause serious epidemics of encephalitis in regions wherever they are present, as in Japan. Subsequent investigations have revealed the presence of many other viruses in different parts of the country. Infections due to West Nile virus have been noted. It is obvious that these studies have to be extended a great deal, which will help in the elucidation of the etiology of many of these infections the precise nature of which is yet unknown.

General recommendations :

In the foregoing account we have attempted to indicate briefly the problem of virus diseases prevalent in India and have also indicated the steps to be taken in respect of some for their prevention.

The need for the manufacture in the country of prophylactic vaccines already developed has been stressed. Attempts should be made for the development of similar vaccines for other infections. We are glad to note that the preparation of a suitable vaccine against the KFD is receiving attention. We would, however, like to point out that unless there is over-all improvement in environmental sanitation, no material impact will be made on the prevalence of such infections in the community. We are aware that improvement in the environmental sanitation will take a long time and, in the case of some viral infections like

poliomyelitis, improvement in environmental sanitation will in itself create further problems regarding the epidemiology of that disease. We would, however, like to emphasise the importance of conducting these studies at as many centres in India as possible. At present there is a paucity of trained workers in this field. We feel it is imperative that deliberate attempts be made to train as many scientists as possible to undertake work in the diverse aspects of the problem at as many centres as possible. It must be remembered that, in the elucidation of the problems created by arbor viruses, the services of Entomologists, Zoologists and Veterinarians are also needed. In any training programme, the training of workers in these specialities should not be lost sight of. As and when such trained personnel become available, attempts should be made to develop diagnostic service units for viral diseases at suitable regional centres. As has been stated earlier, both entero-viruses and arbor viruses produce a picture of encephalitis in those affected. Unless detailed studies are made, the nature of the etiological agent cannot be ascertained. It is, therefore, necessary to create teams for epidemiological studies at centres where these manifestations occur and, after preliminary investigation, distribute the material available for further processing in either laboratories devoted to the studies of arbor viruses or entero viruses. By the very nature of the work involved, these studies cannot be undertaken at any one single centre and, therefore, facilities for the intensive studies of all the types of viruses — respiratory, enteric or arbor — should be created as soon as possible.

There is yet another problem to which we would like to draw attention. That entero virus infection can occur through contaminated water supplies has been referred to above. Knowledge concerning the purification of water supplies from this point of view is extremely meagre at present. It is necessary to create special facilities in order to develop methods of water purification which will be able to deal effectively with these agents, should they gain access to water sources. We are happy to note that the Public Health Engineering Institute at Nagpur, established by the Council of Scientific and Industrial Research, is alive to this problem.

CHAPTER VIII

PROFESSIONAL EDUCATION

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1. Introduction

The expression 'professional education' as applied to medicine and public health may be broadly defined as education comprising those courses of training which are necessary for the proper preservation of the health of the nation. It will thus include the training of doctors, dentists, pharmacists and pharmacologists, public health personnel, nurses and midwives, and several varieties of para-medical personnel so essential for the proper co-ordination of all aspects of medical and public health care. The para-medical personnel will include auxiliary medical and public health personnel like public health engineers, laboratory technicians, radiographers, dieticians, dental auxiliaries, vaccinators, malariologists, etc. Many of these basic personnel have been trained during the past several years and posted to the different institutions in this country and efforts have been made from time to time to increase the number of training courses for para-medical personnel. The training given to these persons will have to be such as to fit them to their respective roles and to give the necessary impetus for such trained persons to acquire a higher knowledge of the subjects in which they are interested.

Post-graduate training in the field of professional education is of paramount importance so that the level of education may be kept up by such highly trained personnel. With the modern concepts of the responsibility of the State for the health and welfare of the people and with the demands of the general public for provision of at least the basic needs for the preservation of health, the State has to give greater emphasis to programmes calculated to make available a sufficient number of the personnel required in these directions. If the growth in population of the country is also taken into consideration, it is obvious that the demand for health personnel must be much greater. We have therefore to take note of these factors and evolve such methods as would enable the country to meet the demands in as satisfactory a manner as possible within a measurable period of time.

As more and more advances take place in the field of science, greater and greater specialisation will be required which, in turn, will necessitate concentrated efforts to develop highly specialised institutions where such facilities may be made available. We have no doubt, that in future the aim and objective of all professional education in India will be to make the country self-sufficient in the respective fields, so that much of what has got to be learnt will be taught in the country itself.

At the same time, we realise the value of a knowledge of the nature of the work carried on and the methods adopted in other countries. We have no doubt that, at all times, those who have had their training in any one country will benefit by visits to other countries. The cross-fertilization of ideas that will result from the experience gained at famous clinics and well recognised institutions will help to upgrade the whole level of education and research.

(1) Undergraduate Medical Education :

(a) Early history of Medical Education in U.K., U.S.A. and India :

In different countries, various steps have been taken from time to time to see that professional education in the faculty of medicine is standardized and that those who pass out of these institutions have at least the minimum amount of knowledge requisite for registration. Thus, the General Medical Council of Great Britain was established in 1858, charged with the function of supervision and regulation of the standard of professional knowledge, registration of qualified medical men and the publication of the British Pharmacopoea. The broad plan of the medical curriculum was laid down by the General Medical Council in 1867 and the Medical Education Committee of that country decided in 1869 on the order and content of the subjects to be taught. This pattern was continued till recently when the specialities began to be gradually introduced into the undergraduate medical curriculum. Reform of medical education has been the constant endeavour of the authorities in most countries of the world, as indeed reform has been attempted in regard to all aspects of general education. Among the important reports which surveyed the position with respect to medical education may be mentioned the Selbourne Commission's Report on "Advancement of Higher Education in London", the Goodenough Report on "Inter-departmental Committee on Medical Schools", the Fullbright Committee Report and the British Medical Association Report on Medical Education.

In the United States, the first medical college was started at Philadelphia in 1765 and the medical school at Yale was established later in 1813. Other Universities like Columbia, Harvard and Dartmouth followed suit. The course of study extended over a period of 7 years but this was subsequently reduced to 4 years in view of the higher qualification prescribed for entrants to the medical course. A bold experiment was tried in the John Hopkins Medical School at Baltimore where a degree in arts or science was prescribed as the entrance qualification for admission to the school. It was in the year 1911 that the first step was taken to see that the somewhat haphazard development of medical schools in that country was regulated. The variations in standards were

carefully reviewed by the Flexner Committee and the report of this Committee led to the upgrading of several of the medical schools and the abolition of a large number of others which were ill-equipped for this purpose.

Medical Education in India has been in existence for many centuries and may be said to date back to the post-Vedic period (660 B.C. to 200 A.D.). Medicine as a subject of study was taught in the Universities of Taxila and Nalanda. There is a sufficient proof of the high ideals placed before the medical schools of those early times. Susruta and Charaka are names known the world over for their contribution to Indian systems of medicine and the classical writings of these authors are still a perennial source of study for persons who wish to be trained in the Indian systems of medicine. With the advent of the British into India, the system of medicine known as western medicine or modern medicine was introduced in this country. At first the aim was largely to train apprentices to help the Army medical personnel, the qualification required of such trainees being of an elementary nature. It was about the year 1835 that a more comprehensive system of training was instituted in India. In 1846, a two-year course, later extended to 3 years, was started for the training of Hospital Assistants. This enabled them to join the subordinate medical services in the Army and in the civil cadres in British India.

After the establishment of the three Universities of Calcutta, Bombay and Madras in 1857, medical education was taken over by the Universities which granted the qualifications of a Licentiate in Medicine and Surgery (the L.M.S.) and the M.B.C.M. degree. The entrance qualification for the former course was a pass in the Matriculation examination and for the latter course, the Intermediates were eligible. Subsequently, the Licentiate qualification was abolished and the degree of M.B.B.S. was awarded by the Universities. The qualification of M.B.B.S. granted by the different Universities was recognised by the General Medical Council of Great Britain and the standards were in conformity with the requirements laid down by the General Medical Council for such recognition. In 1933, the Medical Council of India was constituted which took over the functions hitherto exercised by the General Medical Council of Great Britain for the maintenance of uniform standards of medical education in the country.

(b) Recommendations of the Bhore Committee :

The Bhore Committee, dealing with Professional Education, stated :
“ Having given serious consideration to the suggestion that, in the conditions now prevailing in the country, it might be desirable to provide both

fully trained doctors and a less elaborate type of medical man, the conclusion which the majority of us arrived at is that, having regard to the limited resources available for the training of doctors, it would be to the greater ultimate benefit of the country if these resources were concentrated on the production of only one and that the highly trained type of physician whom we have termed the 'basic' doctor."

Among the other recommendations of the Bhore Committee may be mentioned the changes suggested in the undergraduate curriculum which included the following :

A reduction in the hours of didactic instruction in certain subjects and an emphasis on the inclusion of principles and methods which will enable the student to learn for himself, think, observe and draw conclusions ;

The establishment in every medical college of a department of Preventive and Social Medicine so as to give the student an insight into social health problems by contacts with home and community life ;

" The inclusion of a year of internship after the qualifying examination, of which three months will be devoted to work in a public health unit and the remaining period in a hospital of approved standard ;

Throughout the whole course, the importance of research should be stressed and whole-time teachers should themselves engage in research and encourage any student showing an aptitude or leaning towards this aspect of his work to participate in research.

The Committee also recommended that post-graduate education should be given to meet two different needs, (1) the training of consultants and specialists and (2) the training of practitioners desirous of practising a speciality without the definite status of a specialist. In the case of the first category, it was recommended that such training would naturally involve several years of work in special departments and hospitals, leading to a higher qualification such as the M.D. or M.S. In the case of the second category, the training in the speciality may range from 12 to 18 months depending upon the particular speciality and under suitable guidance. The Committee recommended the institution of a Diploma qualification for the following subjects :

- (i) Oto-rhino-laryngology,
- (ii) Dermatology,
- (iii) Radiology, diagnostic and therapeutic,
- (iv) Ophthalmology,

- (v) *Obstetrics & Gynaecology,*
- (vi) *Venereology,*
- (vii) *Anaesthesia,*
- (viii) *Psychiatry,*
- (ix) *Pediatrics,*
- (x) *Tuberculosis ;*
- (xi) *Malariology,*
- (xii) *Blood transfusion and resuscitation, and*
- (xiii) *Orthopaedics.*

One of the main recommendations of the Committee was the establishment of a special organisation, the Central Committee for Post-graduate Medical Education, to be responsible for laying down standards in respect of postgraduate training in particular subjects and for promoting the development of facilities for such education in different parts of the country on a co-ordinated basis.

The Bhole Committee also referred to the urgent necessity for promoting other types of professional education. Thus, so far as dental education was concerned, it was suggested that three types of dental personnel should be trained, viz., the dental surgeon, the dental hygienist and the dental mechanic, the responsibility for the training of the dental surgeon being shared between the medical and dental colleges. They advocated the passing of suitable legislation directed to compulsorily register dental practitioners and to prohibit the practice by unregistered persons. The Committee recommended the fostering of postgraduate dental education on the same lines as medical education.

Under Pharmaceutical Education, three classes of personnel were recommended : licentiate pharmacists, graduate pharmacists and pharmaceutical technologists. The first class was intended to provide for the large number engaged in dispensing work in chemists' shops, dispensaries and hospitals. The course for the graduate pharmacist was designed to train the smaller number who will be engaged in manufacturing concerns, analytical laboratories and educational medical institutions. The third type of course was for those desiring to take up the manufacture of pharmaceuticals and drugs on a commercial basis, and it was suggested that besides the graduate course in pharmacy, there should be an additional course of one year in chemical technology, design and equipment for such persons.

As regards Public Health personnel, besides the post-graduate training for qualified medical men, the importance of a reasonably high standard of training in this branch of medicine in the curriculum of the undergraduate medical student was stressed. Post-graduate training in

tion offered for meeting the shortage was (i) training of medical teachers at the All India Institute of Medical Sciences which was expected to supply a "steady stream of teaching personnel of the highest quality", (ii) experienced teachers from foreign countries on a short-term basis, (iii) training abroad of at least 200 selected members of the medical profession from the various provinces of India for periods ranging from 2 months to 2 years to acquire a knowledge of the improved methods of teaching, particularly in Anatomy, Physiology, Biochemistry, Pathology, Bacteriology and Pharmacology, and (iv) encouraging younger men of the profession in increasing numbers to acquire post-graduate qualifications in this country and later rounding off their education by visits abroad for periods ranging from 6 months to one year.

To preserve a uniform standard of medical education it was urged that the only channel for the grant of medical qualifications should be the Universities.

In order to prevent economic barriers standing in the way of suitable persons entering the medical profession, the Bhoré Committee suggested the grant of stipends of Rs. 1000/- per annum each to 50% of the entrants on condition that such stipendiaries agreed to enter public services.

The other important recommendations related to the conversion of medical schools into medical colleges, improvement of certain existing colleges and establishment of new colleges.

(c) Present position :

Taking stock of the situation after a lapse of over fifteen years since the above suggestions were made it is noted that

(i) All medical schools except one have been up-graded into medical colleges.

(ii) Some of the old medical colleges which were deficient in certain respects have been improved.

(iii) 46 new medical colleges have come into being ; as against 15 colleges before 1946, the number rose upto 50 in 1958 and the present number is 61. As against 1,200 seats in medical colleges in 1946, at present there were available 5,900 seats for admission.

(iv) The number of qualified teaching personnel available has not, however, increased proportionately with the increase in medical colleges. As a matter of fact, it has been estimated that today the shortage of qualified teachers in all medical colleges is of the order of 2,000.

(v) In regard to the suggestions proposed by the Bhore Committee for the production of high grade teachers, it may be mentioned that the All India Institute of Medical Sciences which started functioning in 1956 has not been in a position yet to produce the "steady stream of teaching personnel" that was envisaged.

(vi) The Government of India have tackled the question of training abroad of medical men from all over India in collaboration with international agencies. From 1946 to 1949 there was a Government of India Overseas Scholarship Scheme. After 1949 this gave place to a fellowship scheme conjointly with international organisations like the W.H.O., T.C.M., Rockefeller Foundation, Colombo Plan, etc. Appendix B-26 will give an idea as to how many trainees have so far been awarded scholarships or fellowships and the different subjects they have specialised in.

The shortage of qualified teaching personnel in view of the rapidly increasing number of medical colleges is still greatly felt.

(d) Recent developments :

The WHO Expert Committee on Professional and Technical Education of medical and ancillary personnel in its report in 1952 stressed the relationship between the basic and clinical sciences and the necessity for internship after completion of the formal course.

The First World Medical Education Conference which met in London in August 1953 reviewed the requirements of entry into medical schools, the aim and content of the medical curriculum, the technique and method of education and the importance of preventive and social medicine in the training of physicians.

The S. E. Asia Regional Office of the W.H.O., in their analytical study of Medical Education, recommended the reorientation of medical teaching from the predominantly individual and curative approach to a more community-minded and a preventive one.

The Medical Education Conference organised by the Government of India in 1955 after considering the proceedings of the World Medical Education Conference recommended major reforms in medical education in India. This Conference made several suggestions in regard to selection of students, entrance qualifications including pre-medical studies, curriculum of medical education, examinations, full-time teaching units, etc.

They stated that the development of a common criterion for selection of students for medical colleges will have to await the reorganisation

and improvement of secondary education as recommended by the Secondary Education Commission. Pending such reorganisation, the Medical Education Conference allowed each college to continue its present method of selection of students on the basis of the academic record and the extra-curricular activities, together with an interview intended to ascertain the nature of extra-curricular activities of the candidates. They also agreed that reservation should be made in the case of backward communities and slightly lower standards prescribed for candidates from such communities. The Medical Education Conference stated that records should be kept of each student regarding his academic attainment, his extra-curricular activities and any personality and aptitude factors so that such records may be reviewed periodically for the purpose of arriving ultimately at a suitable method of selection of students for medical colleges. As suggested by the Mudaliar Commission a pre-professional course of one year would meet the requirements of a pre-medical education. It was also suggested that selection of a student for medical training might be carried out even after the Matriculation Examination and that the student's training in the Intermediate course may be suitably modified so as to equip him better for medical education later.

The Medical Education Conference agreed that the present methods of examinations and assessment were unsatisfactory, that written examinations required considerable modification and that great importance should be given to the day-to-day assessment of the student during his medical course.

It was recommended that each medical college should have a Preventive and Social Medicine Department with full-time staff. The teaching of Preventive and Social Medicine should start from the very beginning and continue throughout the period of training including the period of intership. The functions of the Preventive and Social Medicine Department should be integrated with the teaching of the other departments along with a co-ordinated out-patient service. This department should have rural and urban health centres which will give the necessary facilities for rural training. A separate examination in Preventive and Social Medicine should be made part of the final M.B.B.S.

A compulsory course of elementary statistical training should be provided for all students in the pre-clinical period.

At least one full-time unit should be provided in each department in order to bring about definite improvement in teaching and in promoting research. Full-time teachers should be prohibited private practice and be given satisfactory emoluments.

- The existing teacher-student ratio in medical colleges should be increased substantially to 1 : 5.

The Medical Education Conference also recommended that a separate Department of Paediatrics should be established in each medical college and that at least 3 months should be devoted to this subject.

In order to orientate the student in Psychological Medicine, teachers should emphasise the psychological and sociological influence on illness.

(e) Objectives of Medical Education :

The objective of a good medical education should be to produce general practitioners, specialists, teachers and research workers. The factors governing this are the curriculum, medium of instruction, duration of the course, admission qualifications and criteria, number of admissions, reservations and other controlling elements in the matter of admissions, teachers, their nature and quality, the examination system, teacher-student relationship, prospects of teachers and students, provision of equipment, drugs, library, extra-curricular activities in institutions, and lastly the controlling authority over medical institutions. The present position in regard to these various factors will be discussed later on in this Chapter.

We might also mention that medical education should fit in with the needs of a country and the conditions obtaining there. For instance, India being more than 80% rural, the training given to a doctor should enable him to carry on his work among the vast masses in the villages.

(f) Defects in present system of Education :

The reasons generally advanced for the backwardness of medical education in India at present are (i) insufficient knowledge of English, pre-medical sciences and humanities on the part of students, (ii) lack of experienced teachers and well-qualified personnel owing to conditions of service not being attractive, and (iii) lack of sufficient number of whole-time teachers and overall insufficiency in the number of teaching personnel. In general the teachers have too many students to teach and too little assistance. Students on the other hand are being grossly over-examined while being under-taught. The position of teaching facilities in colleges is very unsatisfactory. Able men in the profession are unavailable for teaching posts because of the unattractive terms of service.

It has been estimated that there is a deficiency of 2,000 qualified teachers in the different medical colleges. It may be mentioned that this shortage amounts to 45% in the total number of teaching personnel, 60% in regard to senior teachers and 50% in regard to teachers with post-graduate qualifications.

At present there is considerable difficulty in getting qualified teachers for pre-clinical subjects like Anatomy and Physiology and for clinical laboratory subjects like Pharmacology, Pathology, Bacteriology and Biochemistry. In this connection it may be stated that the utilisation of trained personnel in these fields from the ranks of non-medical men to fill certain of the posts in teaching institutions, research institutions, and in other hospitals has not been fully realised. The appointment of such non-medical men to teaching institutions will to some extent ease the situation by freeing medical men from some of the routine duties and enabling them to devote more time to some of the important aspects of teaching and research.

The pay scales of the teaching staff in the various colleges in India vary so widely that it is obviously impossible to attract the best men. For instance the pay scale of a Professor varies from Rs. 500-800 to Rs. 1,300-1,800. There is again a difference between Professors of clinical subjects and Professors of non-clinical subjects, between a Government institution and a non-Government institution. Details of pay scales obtaining in the different medical colleges are given in Appendix B. 63.

Similarly the method of recruitment of the teaching staff is far from uniform. It is sometimes done through the Public Service Commission and sometimes through special Selection Boards and Committees after advertisement. In filling the posts of Senior Professors consideration is normally given to the claims of the existing members of the staff for promotion.

The recommendation of the Bhoré Committee in regard to full-time units in teaching institutions has not been generally implemented, in spite of the fact that the Central Government offered financial assistance to State Governments during the Second Five Year Plan for this purpose.

As for the type of candidates who could be advantageously taken in for the medical course, although the minimum basic qualification has been kept as pre-University, delimitation of the particular groups in the course, district-wise quotas, undue emphasis on interviews, reservation of seats in certain colleges to students hailing from the individual districts where the colleges are situated, reservation for scheduled castes and backward communities, which is incumbent under the Constitution, have all tended to limit the number of well-qualified students being admitted to colleges.

While we recognise that as per the Constitution and for a certain period, it will be an obligation on the part of the Government to encourage the admission of a certain number of candidates belonging to the sche-

Government gave financial assistance for the opening of 20 training centres for laboratory technicians. Training is being given to refractionists and opticians in four centres in States. The auxiliary health worker or health assistant, who is intended to carry out relatively simple technical procedures normally performed by sanitary inspectors, laboratory assistants, vaccinators and others in rural areas, is being trained in two or three centres in a State with assistance from the Centre.

(j) Pharmacists Training :

The profession of pharmacy before the Pharmacy Act was brought into force was generally the last resort for persons who could not complete their high school course or perhaps who were found intellectually unfit to pursue any other career. A rudimentary type of training was imparted to compounders in the preparation of stock mixtures, ointments, pills, etc., and they carried on the profession by empirical means.

The Drugs Enquiry Committee of 1931 emphasised the importance of the profession in the health services of the country. They also recommended legislative means for regulating the practice of the profession, and suggested detailed courses of study for pharmacists.

The Bhole Committee also stressed the importance of the profession of pharmacy and the need for a thorough overhaul in that profession apart from legislation to protect the public from the incompetence of unqualified pharmacists.

The Pharmacy Act of India was enacted in 1948. This Act aims at regulating the educational standards and training of pharmacists and also the profession of pharmacy. The Indian Pharmacy Council was then constituted. It is now possible for the Council to enforce a uniform training for pharmacists throughout the country by inspectors of the Council visiting institutions which conduct courses of study for a diploma or degree in Pharmacy. There are State Pharmacy Councils also for the purpose in all the States except one.

The standards of training for pharmacists have been upgraded. Only matriculates with science can be admitted to the diploma course and practical training has been emphasised at all stages of the course which lasts for 2 years. There are at present 7 institutions in the country approved by the Council for the diploma course in pharmacy and some more are coming up. It is understood that the Pharmacy Council has prepared a model scheme for an institution providing the diploma course for the guidance of State Govts., Universities, etc., who desire to start such a course. The Council has also prepared a model

It is, however, observed that State Govts. have not yet appreciated the need for providing training facilities in Pharmacy nor has sufficient provision been made in their Third Five Year Plans for the improvement of the profession.

It may be mentioned that under the Drugs Act it is necessary for all dispensing establishments to maintain pharmacists. The Primary Health Centres would also be requiring a large number of pharmacists apart from rural dispensaries and hospitals. It is anticipated that the minimum number of pharmacists that will have to be trained throughout the country to meet such increased needs will be of the order of 15,000, so far as the public sector is concerned and an additional number will be required in the private sector. The number of pharmacists registered upto 31st December, 1959 was only 42,030. If the recommendation of the Bhole Committee, namely, that there should be at least one pharmacist for every 3 doctors, is to be implemented, provision should be made to train at least about 3,000 pharmacists annually. As against this the number of seats available in the various institutions for the diploma in pharmacy course is only 433.

It is, therefore, recommended that State Govts. should start more training institutions for the diploma course in pharmacy and that the Central Government should give necessary financial assistance for this purpose.

(k) Public Health Engineering personnel :

An important development in the training of public health personnel is the institution of courses for the training of public health engineers, overseers, water-works and sewage treatment operators and sanitary inspectors, at three places, namely, Calcutta, Madras and Roorkee. An acute shortage of such technical personnel has been felt, particularly in the implementation of the National Water Supply and Drainage Schemes. Besides this, there has been in existence a course for the Master's Degree in Public Health Engineering at the All India Institute of Hygiene and Public Health, Calcutta. The scheme for training referred to above did not have encouraging response from the States in the first instance, but later on they have taken greater interest, thanks to the activities of the Ministry of Health, the Central Public Health Engineering Organisation attached to the Directorate General of Health Services, the Central Council of Health and certain international organisations, like the W.H.O. Further details regarding the shortage of Public Health personnel will be found in the chapter on 'Medical Care'.

(2) Post-Graduate Medical Education

(a) Definition :

The term "post-graduate medical education" is used for the education after Graduate qualification to become either a Specialist or Consultant or Research Worker or a Teacher.

(b) Recommendations of the Bhore Committee :

The Bhore Committee recommended the training of Consultants and Specialists and the training of practitioners desiring to practise any speciality without being given the definite status of specialists in certain branches of medicine. They also suggested the constitution of an All-India Council for Post-Graduate Medical Education and the organisation of post-graduate teaching in Universities under Post-graduate Councils on which members of the medical profession who are on the Faculty or the Board of Studies in Medicine along with representatives of Government would be present. The establishment of a Central Council for Post-Graduate Education was designed for the purpose of supervising the post-graduate training in various States and for advising the State authorities to have uniform standards. It was recommended that there should be post-graduate institutes for special disciplines to cater to the medical graduates in each province and all-India Training Centres by developing existing provincial post-graduate institutions. Refresher courses should be conducted for general practitioners either whole-time or part-time. It was hoped that the All-India Medical Institute when established would bring together in one place educational facilities of the highest order for the training of the more important types of health personnel, for research in all branches and for the promotion of community outlook and a high degree of culture in students.

The All-India Medical Institute was intended to be on the model of the Johns Hopkins Medical School in the United States. It should be in a position to influence medical education profoundly.

(c) Implementation :

On the recommendations of a Committee appointed by the Government of India in 1949, upgraded departments have been set up in a number of medical colleges with the assistance of the Government of India.

(d) Post-graduate Medical Education in other countries :

An idea of the post-graduate medical education available in other countries is given below. In Great Britain post-graduate diplomas like

F.R.C.S., M.R.C.P. and M.R.C.O.G. are given by the Royal College of Surgeons, the Royal College of Physicians and the Royal College of Obstetricians and Gynaecologists. After qualifying for the M.B.B.S. the student may proceed to obtain the M.D. or M.S. by presenting a thesis or by passing an examination. There is, however, no uniform scheme, common to all the Universities in Great Britain in respect of the M.D. or M.S.

In the United States, post-graduate and specialist qualifications are provided in the following manner : In non-clinical departments, University degrees such as M.S. and Ph.D., are provided. Post-graduate medical education in the United States has attained a high degree of progress by residency and interne training programmes. There are more than 1,200 hospitals in the United States which are recognised for giving post-graduate training in clinical specialities. There are American Speciality Boards to conduct examinations to grant and issue certificates and to stimulate the development of adequate training facilities.

In Russia the post-graduate medical degree, which is necessary for occupying faculty posts, is the degree of Doctor of Science. There are 11 institutions for obtaining post-graduate degrees in various branches of medicine.

-(e) Recent developments and objectives of post-graduate medical education :

The First World Conference held at London in 1953 dwelt largely on the subject of undergraduate education and the manner in which the basic doctor should be trained. The Second World Conference on Medical Education devoted its attention to the subject of further training of the graduates, in other words, to the subject of post-graduate medical education. The training of the graduate in the Faculty of Medicine does not limit itself to any particular field. In the light of the recent phenomenal developments in all sciences, the necessity for making available to medical graduates in practice the latest knowledge of scientific principles in their application to medical sciences would appear to be obvious. The object of post-graduate medical education should therefore, be much wider in conception.

Post-graduate medical education can be said to cover the following purposes :

1. To afford further facilities for the general practitioner to keep himself up-to-date in this field. (This is of the utmost importance for it is on the general practitioner that the duty will largely devolve of caring for the health of the patients entrusted to his charge and for the prevention of diseases by suitable

advice to his clientele and for the early detection of those diseases) ;

2. To enable the graduate —

(a) to obtain proficiency by practice and study in the larger fields of surgery, medicine, obstetrics and gynaecology and social medicine ;

(b) to specialise in any of the fundamental specialities in medical or surgical fields ; and

(c) to equip oneself by specialised training and study with a view to pursue a career of research in medical sciences.

3. To train persons thus equipped either in the general fields of medicine or in the specialities thereof to discharge the duties of the teaching profession in the Faculty of Medicine.

It is not often realised that certain special qualities and qualifications are necessary for one to become an efficient teacher. The best of such training is generally by being an under-study to a famous teacher who has made his name well-known amongst post-graduates and medical students.

Today, the urge for post-graduate training is great with many practitioners and the multiplicity of qualifications awarded on certain tests either by the Universities or by well-recognised and authorised Associations has naturally led to a large number of candidates trying to acquire these qualifications, who would not all of them be the most suitable persons to benefit by such training. It would therefore, appear that there is necessity to consider the methods of selection of candidates for post-graduate study. From another point of view, this is inevitable as in the field of post-graduate study, the numbers to be trained in any particular Unit for any speciality must be strictly limited if proper training is to be given to them and proper opportunities afforded to study the cases or to help in surgical operations and to familiarise themselves thoroughly with the routine needed for effective post-graduate training.

Another main consideration is : what are the institutions which can be recognised for post-graduate training ? There is a tendency of late to try to have recognition given in many a subject of post-graduate study to institutions which are training centres for undergraduates. In such institutions, the facilities available for training of post-graduates are either inadequate or the personnel needed are insufficient. It is difficult for lay authorities to recognise the extent to which lack of proper facilities either in the shape of personnel or equipment may hinder the proper training of post-graduates.

The next consideration is : what are the conditions necessary in institutions wishing to qualify as recognised institutions for post-gra-

duate instruction? And what is the agency best fitted to determine whether such institutions could be recognised for the different types of post-graduate instruction? The time is come when, for such purposes, there should be at the national level a high level committee constituted with the best elements in the medical profession whose authoritative opinion will be accepted without demur. In many countries today, not only the nationals of the country concerned but the nationals of many other countries, where the facilities are not always available or are inadequate, wish to pursue post-graduate studies in properly equipped institutions. The responsibility therefore lies with the National Council for Post-graduate Education which should be constituted to take charge of these functions of inspection, recognition and approval of such institutions. It is also wise to lay down that recognition once given should not automatically continue. Much of the fame of post-graduate institutions rests not upon elaborate equipment or even the number of cases that may be treated, but on the personnel who should be of a high grade and commanding the confidence of the medical profession, for the particular task entrusted to them. In fact, the method by which in some countries, institutions are known after such outstanding individuals is far more conducive to effective growth of centres of post-graduate medical education than a recognition given and continued on a first assessment of the facilities available.

There is yet another point that arises out of these considerations. While no dead level of uniformity is to be aimed at, whether it be in the undergraduate or the post-graduate stage, it would be essential to see that a minimum of efficiency is maintained for the candidates to claim themselves to be successfully trained as post-graduates. Whether post-graduate qualifications are given as degrees or diplomas or in other ways, satisfactory tests not merely by examinations but by such means as could ensure that the trainees have benefitted by post-graduate instruction, should be devised.

A point of considerable importance, which has arisen in recent years, is: should post-graduate instruction be developed in undergraduate educational centres or should it be given in separate post-graduate hospitals? This is a problem of considerable significance. It has been argued that the association of post-graduate instruction with undergraduate instruction necessarily leads to a higher type of training that will be available in these institutions for undergraduates. Per contra, it has also been suggested that in such institutions, the undergraduates are not given all the facilities that they ought to have nor the individual attention that is necessary for such undergraduates and that the bulk of the teachers are interested in post-graduate instruction and in the work which would benefit largely the post-graduates. The time of the under-

graduate should not be wasted in witnessing, for instance, very complicated operations as he would, at that stage, be not in a position to fully understand or appreciate the technique involved. On the other hand the post-graduate teacher has enough work of his own and he cannot possibly spend much of his time on the routine sort of instruction that should be given to the under-graduate and on simple procedures which the *undergraduate must make himself familiar with, for purposes of general practice.* The question therefore, has to be decided whether in such undergraduate education centres, a limited opportunity for a few of the post-graduate courses may be given such as the basic post-graduate courses in medicine or surgery and the more differentiated post-graduate courses in the specialities may have to be located in post-graduate centres where proper facilities will be available for the post-graduates and for the teachers thereof.

It would be a mistake however, to consider post-graduate medical education without considering also the necessity to tone up post-graduate instruction in allied fields such as nursing, public health nursing, social medicine and in the other branches of anatomy, physiology, pharmacology, bacteriology, pathology, bio-chemistry as well as dentistry. None will deny that efficient post-graduate instruction in the clinical fields implies efficient post-graduate instruction in these other subjects and in fact it is idle to conceive of proper methods of investigation, diagnosis, prognosis and treatment without adequate aids in these fields being available. The training given should therefore, be of a comprehensive nature including not only the basic medical sciences but some of the fundamental physical and biological sciences.

It is hardly necessary to add that so far as research is concerned, the importance of the fundamental medical sciences as well as the physical and biological sciences cannot be over-emphasised.

If the specialist is really to function efficiently, the assistance of a well-trained, efficient general practitioner is essential. It is the general practitioner who forms the backbone of the medical profession and whom the bulk of the population must necessarily look to, not merely in urban areas but more particularly in rural areas. The training of the general practitioner therefore, should be a special responsibility of the profession, *of all post-graduate teachers and of the specialists : and it is for this reason* that every training institution in the Faculty of Medicine should make a special effort to see that refresher courses are given as frequently as possible and in a practical manner to these general practitioners. The whole efficiency of the medical services of any country ultimately depends upon the standards which that country has adopted for and which are prevalent among the general practitioners.

II. RECOMMENDATIONS REGARDING PROFESSIONAL EDUCATION

1. Undergraduate Education

(a) Basic qualifications for admission to the medical course :

So far as the pre-requisites for entrance to medical course are concerned, two facts need to be emphasised.

Firstly, the students must have full proficiency in the medium of instruction and should satisfy the minimum requirements with regard to training in basic sciences. The Committee endorses the opinion of the conference of principals of Medical Colleges that English should continue to be the medium of instruction in the medical colleges.

Secondly, graduates in mathematics and physical sciences and natural sciences should be encouraged to seek admission to medical colleges, provided they possess first or second class degree and their pre-university record is of a minimum standard prescribed for admission to medical colleges and provided also that in the first year of the pre-clinical course they take up study of the subjects not covered, and pass an examination equivalent to the pre-professional standard before they are admitted to the first professional examination. Graduates may be selected along with those who pass pre-university or the pre-professional course according to merits. I and II class graduates can be admitted to the I year of the medical course, if they have the basic pre-professional requirements for admission to a medical college. The number of these students to be admitted in the medical colleges should not be less than 10% of the total number of admissions and special courses may have to be given for them and the time-table may be arranged in such a manner as to provide facilities for coaching outside the usual college hours.

(b) Method of selection of candidates :

Where an interview is considered desirable the Committee would suggest that not more than 10% of the total marks i.e. marks obtained in the University examination in the subjects concerned, should be assigned for the interview and in the interview the following factors should be taken into consideration :—

- (i) Extra-curricular activities,
- (ii) Membership of the N.C.C., Boy Scouts and Girl Guides,
- (iii) Sports, athletic activities, and
- (iv) Personality including physical fitness.

In the case of sports the assessment should be on the basis of candidates having reached University, Inter-University or National ranking.

We do not recommend an examination for candidates who wish to join the medical colleges. The best thing would be to select students on merit from the general examination conducted by the University which is the prescribed qualification for entrance in the medical colleges. The Committee took note of the fact that in some States a separate entrance examination is held for admission to medical colleges. According to the statistical analysis made in respect of admissions to certain colleges under the control of the Central Government, where candidates from different Universities had to take an entrance examination, it appeared that there was no wide difference between the marks obtained at the entrance examination and those obtained in the I.Sc. examination held by the different Universities. If, however, an entrance examination is envisaged by any State Government, it should be a common examination for the whole State, although the Committee feels that this procedure may cause undue delay, because of the necessity for receiving the applications after the results are published by the Universities and the holding of the entrance examination and declaration of the results thereof. The marks taken into consideration should be in respect of the three main science subjects and English which will still be an important language as far as reference to literature is concerned.

(c) Selection Committee :

The Selection Committee for interview should consist of Principals of Medical Colleges concerned in the State with a senior Principal as Chairman. It is desirable that an educationist of standing, nominated by rotation by one of the Vice-Chancellors, should also be a member of the Committee. It is also desirable that there must be for each State a common selection committee for selecting students for all the Medical Colleges in that State, Government or aided.

(d) Reservation of seats :

Taking into consideration the necessity to encourage a sentiment of unity among all citizens of India and also taking into consideration that there are cases of parents from one State migrating to another, either for official duties or duties connected with trade and business, the Committee feels strongly that there must be all facilities for students belonging to one State being admitted in the colleges of another State where they seek admission. While it is recognised that the interests of the students of the State concerned should necessarily be kept in view and they should be given first preference, the Committee feels that a minimum of

5% of the total number of seats should be reserved for such special cases. This reservation will not include those special cases where for various reasons the Government of India wish to sponsor students from outside India for particular courses of study.

If the number of seats reserved for scheduled castes and scheduled tribes and for backward communities are not filled, such seats should be taken in the general pool and filled by selection on merit.

Except for the constitutional obligations in respect of special facilities to scheduled castes and scheduled tribes and certain backward communities recognised as such, no other reservations should be continued.

There should be no fettering in the selection of students and merit should be the only consideration.

(e) Women Students :

We feel that at present the tendency has been for women to come by merit to the positions that they occupy in the medical profession. In some States, however, it has been pointed out that there has been a dearth of women students and some encouragement may have to be given for a transitional period of not more than 10 years. We recommend that 20% of the seats may be reserved in such States for the women to enter the medical profession. In other States there is no necessity to fix any percentage and they can be taken on the same basis as men students, according to the considerations that we have already indicated. The percentage fixed for women in those States where a limit of 20% is laid down will include those who are taken on merit and others taken because the percentage fixed has not been reached. But if merit be the sole criterion by which the women students come in, there should be no limit and no percentage should be fixed as they come on the same basis as other students.

(f) Age of Admission :

Seeing that this is a professional course which requires a certain amount of maturity in the medical students, who have to deal with patients in the course of their career, the Committee feels that the minimum age of admission to a medical college should be 17 plus on the 1st October of the year when he/she joins the medical college for entrance to the integrated course of 6 years or 18 plus for a regular medical course of five years. It is understood that most State Governments have now fixed 10 plus as the age of entrance to the first year of the seven-year secondary course. In course of time, therefore, it should not be difficult to insist upon 17 plus as the age of admission to the integrated course and 18 plus to the medical course proper.

(g) Duration of Medical Courses :

Pre-clinical : The pre-clinical course of instruction should extend for 18 months. During this course the main subjects of study and examination will be Physiology including Biophysics, Organic Chemistry and Bio-Chemistry and Anatomy including Histology.

It is important that in the teaching of basic medical sciences of Anatomy and Physiology to the undergraduates, stress should be on every student being in a position to understand the practical applications that follow during his clinical years. Thus in the teaching of anatomy it has been stated that the following considerations should be kept in mind :

- * (a) "The average student needs to know only the essentials of anatomy but he should know them really well.
- (b) "Topographical anatomy can only be learnt properly in the dissecting room and a practical book, therefore, should describe only what students can demonstrate in their own dissections.
- (c) "Detail that has no scientific or educational value should be eliminated and time should not be wasted by students trying to reveal features that can only be demonstrated adequately in special preparations.
- (d) "A practical book should give instructions on dissecting and directions on what to observe in sufficient detail to enable the average student to complete his dissection without seeking help from the teaching staff.
- (e) "Only that amount of osteology is included as is essential for a student to understand how the soft parts of the body relate to its bony structure".

Likewise in the teaching of Physiology, the fundamental principles should be emphasised and the mass of details should not be given the importance that is now being given both in teaching and in examinations. If these principles are recognised by the teachers of these subjects it will not be difficult for the subjects to be covered within the period of 18 months.

Clinical : The period of training after the pre-clinical stage should, in the opinion of the Committee, extend to 3½ years, the first six months being devoted to certain topics like Elementary Statistics, Introduction to Psychology and Sociology and Introduction to Medicine.

* (Sir Solly Zuckerman).

(h) Integrated Teaching :

During the 3½ years of clinical training emphasis should be on an integrated method of teaching, the Professor of the pre-clinical subjects having also responsibility and a part to play at this stage. We are of the opinion that the large number of didactic lectures that are now being given should be reduced to the minimum and most of these should be clinical-lecture demonstrations with audio-visual aids wherever possible. We believe that a proper method of instruction will be by limiting it to small groups, no group exceeding 30 students. Besides these, clinico-pathological conferences ought to be held regularly every week both on medicine and surgery and these conferences should be attended by the senior students, i.e., those in the 4th and 5th year classes. We are also of the opinion that the teaching work should not be restricted only to professors, but the other members of the teaching staff who have got the necessary post-graduate qualifications should participate in the instruction that is given to the students. A small number of students should be allotted to these people so that intensive coaching is done during the first period when lectures and demonstration classes are not held. It is necessary to strengthen the existing departments of Preventive and Social Medicine as they are solely responsible for orienting students in the field of public health. Facilities for training of teachers in Preventive and Social Medicine should be developed and fully utilised.

Suitable units should be developed in districts and tehsils, for giving opportunities for training of public health practitioners and for research in community organisations.

A Committee on Public Health Practice should be set up in the Indian Council of Medical Research and an Institution for Research in Public Health Practice should be established in due course.

So far as teaching of surgery is concerned, we are of opinion that too much time should not be spent by students in witnessing rather complicated operations in the theatres. Such time should be more usefully spent on the study of surgical cases in the wards and on methods of diagnosis including microscopic examinations, pathological specimens, bacteriological and biochemical studies and radiography and in the practice of simpler techniques. The tendency in well-developed countries is to televise these complicated operations and let the students see them at other places. We believe that complicated operations may be witnessed only by the senior post-graduate students and house surgeons.

During the clinical training period of 3½ years, it is suggested that the last year should be completely devoted to the study of Medicine, Surgery, Obstetrics and Gynaecology and applied aspects of Preventive Medicine.

The teaching of Medical Jurisprudence should deal only with the broader aspects of jurisprudence including professional behaviour. But in view of the great scientific advancements that have been made in this field the time has now come for governments to establish a separate cadre of medical jurists to whom all important and complicated cases will be referred. We shall deal with this aspect in greater detail in the chapter on Administration and Organisation of Health Services. During the transitional period, however, till such time as properly trained medical jurists are made available, medical jurisprudence should be treated as a subject of study and examination for undergraduate students as at present.

Examinations :

The final examination will be in Medicine, Surgery and Obstetrics and Gynaecology, with the applied aspects of both Preventive Medicine and Pathology. There should be a separate paper on Preventive and Social Medicine, preferably in the final year. Examinations in all other subjects, should be completed by the end of the 4th year of study, i.e., one year before the final examination. The subject of Paediatrics has received importance. We feel that a definite portion of the time of the medical student should be devoted to paediatric education. At least a period of three months should be devoted to it including medical and surgical aspects of paediatrics and a question or two on paediatrics should form part of the Medicine and Surgery papers.

The subject of mental diseases should form part of the undergraduate training.

So far as ophthalmology and otorhinolaryngology are concerned, the Committee suggests that where a separate paper has been in vogue, the practice may be continued.

A general observation that the Committee would like to make is that in the under-graduate studies too much emphasis on specialities to the extent to which it is being done should not be given and the bulk of specialised studies must be reserved for the post-graduate stage or during the period of housemanship. The main emphasis should be to give a correct appreciation of the fundamentals of the subject and leave the students to further develop his own aptitudes and methods of studies, both clinical and otherwise.

We have dealt with the necessity of examinations during the medical course. At the same time we wish to emphasize that examinations by themselves will not serve the purpose of producing a well-qualified basic doctor. Greater importance is in the training that is given and in the methods adopted for making the medical student more and more self-reliant in the study of the various medical problems and cases which

he may meet with. It has been often suggested that unless a particular subject be included in the examination schedule, students are not likely to take much interest. We feel we are bound to say that the interest a student takes in a particular subject depends upon the particular Professor and teachers who are responsible for making their subject interesting to the student. It is these inspired teachers that are more and more necessary in all medical colleges and we hope, that some of our recommendations for the improvement of the class of teachers and for their suitable employment will go a long way to upgrade medical education in our country. A suggestion has also been made that some evaluation must be made of the student's work during the training period and this should be taken note of in the declaration of the results. There is much to commend for such evaluation but in actual practice, we feel grave doubts whether it will be possible, realistic or fair in colleges where a large number of students are admitted and where the personal contact between the student and the head of the department is by no means as intimate as it ought to be. We, therefore, do not at present commend this method of evaluation except to the extent that along with the standard attained by the student in his University examination, a student may be given a certificate by the college concerned giving his general attainment during the college career.

(i) Internship vs. Housemanship :

The Committee has come to the conclusion that internship has not been found as satisfactory as it was anticipated. In the place of internship therefore, the Committee recommends one year's compulsory housemanship with provisional registration as a part of the course of training prior to final registration in the medical register. At least three months of this housemanship period should be spent largely in public health work and out of these three months, one month should be spent in a Primary Health Centre as an Assistant to the Medical Officer of the Primary Health Centre, during which period he/she should be under the supervision of the medical officer-in-charge and should undertake responsibility for all types of work pertaining to the Primary Health Centre. The person so posted should be provided with free accommodation and also given a subsistence allowance which should not be less than Rs. 150/- a month. All House Surgeons should be provided with free furnished accommodation (within the hospitals or at least as near the hospital as possible) and a subsistence allowance of not less than Rs. 150/- p.m. They should be provided with necessary staff for services.

(j) Orientation in rural health :

We have given considerable thought to the necessity of orienting medical students into the problem of rural health and medical relief and

we feel that the best means of achieving this result may be left to be worked out by individual medical colleges. There are certain very good rural centres which are situated conveniently near the medical colleges where students may profitably spend, either during vacation or for short periods during their courses of study, a certain amount of time by being attached to the centres. On the other hand, in large urban areas this may be a little more difficult. We think that the system that is followed by some colleges, of having certain days of the week when students are taken to villages along with the teachers to acquaint them with rural health conditions, may be of some benefit. In some of the urban areas, visits to slums may be of benefit. We think that the Professor of Preventive and Social Medicine and his associates as well as some clinical teachers should take a prominent part in these study tours. Likewise during the period of housemanship it should be the practice for some Professors in Clinical subjects and in Preventive and Social Medicine to take the housemen to rural centres.

(k) Teachers :

Whatever may be the accommodation provided, whatever be the equipment available in medical colleges, unless the teaching staff of the requisite standard with teaching experience are available in sufficient number, under-graduate medical education will never progress. The basic doctor should be such as he can fulfil many obligations in the medical profession and bear many responsibilities. It is therefore, essential that attention should be given to the number of teachers employed in the medical colleges in relation to the number of students admitted to such colleges, the qualifications of these teachers at the different levels and the teaching experience that they should have at these levels.

Uniform nomenclature :

In our view the time has come when some uniform nomenclature should be given to the different types of teachers who would be engaged in the teaching of medical students. On the whole we prefer to have a simple classification which will be (1) Professor including Associate or Additional Professor, (2) Reader or Assistant Professor, (3) Lecturer and Registrar. Lower down in the category will be Demonstrators and Tutors who would be largely persons who have passed out recently and who are utilised for the purpose of helping in practical classes.

Full-time teaching units :

We feel strongly that there should be some full-time paid units in all branches of study. These include the pre-clinical and clinical laboratory sciences and certain of the clinical subjects. In the pre-clinical and

clinical laboratory sciences, we feel that full-time units ought to be available for the teaching of Anatomy, Physiology, Biochemistry, Pharmacology, Pathology, Bacteriology and Preventive and Social Medicine. Besides the full-time units in these departments, we feel that every opportunity should be given to post-graduate students and research workers to participate in teaching, so that they get some practice in the method of teaching. Such teaching experience can be recognised in a higher teaching post to the extent indicated in another place.

In the clinical subjects, we feel that full-time units ought to be available in Medicine, Surgery, Obstetrics and Gynaecology. There has been a rapid development of gynaecological surgery, and taking note of the need of post-graduate training in the subject, we feel that a full-time unit in gynaecology will also be necessary. These full-time units must devote all their time and should not engage either in active or consulting practice. It is obvious that it will not be possible to meet the entire requirements of teaching and medical relief by the full-time staff mentioned above. Part-time teaching units will, therefore, be necessary. We recommend that fully qualified people should be appointed to work as *Honorary Medical Officers and Assistant Medical Officers* in the different departments for teaching and for care of patients. Such honorary medical officers will bring added experience of their general practice both to teaching and to medical care and thus be a valuable addition to the full-time teaching personnel for under-graduate and post-graduate students. For such teaching duties as they have to undertake we recommend that they be paid honorarium suitable to the responsibility that they have to discharge and they should be given the same designation as Professors, Readers and Lecturers, provided they have the necessary qualifications and experience.

Teaching cadre : There should be a cadre of full-time teachers in the categories of Professors, Readers and Assistant Professors who will be liable for transfer only to other teaching institutions.

So far as Lecturers are concerned, we believe that it would be an advantage if occasionally they have experience of work in non-teaching hospitals as well as in the districts. It is from this category of personnel that we recommend that the cadre of Professors and Readers should be selected. Once they prove satisfactory after a period of probation which may extend to two years, they must be regularly in the teaching cadre of the State concerned.

So far as Tutors, Demonstrators and Registrars are concerned, we feel that no Tutor or Demonstrator should be attached to a teaching hospital for more than 5 years. The object of these appointments should be largely to encourage bright young men to acquire additional post-

graduate qualifications during that period and be of service later on for selection as Lecturers in the teaching hospitals.

Qualifications for teaching staff of Medical Colleges: Teachers in all subjects should be medical graduates. This condition might be relaxed in exceptional cases for Physiology, Anatomy and Biochemistry. The Professors, Additional Professors and Clinical Lecturers should have had teaching experience of not less than four years in their particular subjects, viz., Medicine, Surgery, Obstetrics, Pathology, etc., subsequent to obtaining the academic qualifications prescribed for these posts.

Where an M.Sc. or Ph.D. qualification has been prescribed as in Pharmacology, Physiology, Biochemistry or Anatomy, the M.Sc. should have been obtained after a comprehensive test in the subject concerned in addition to a thesis. Persons possessing the M.Sc. qualification, obtained on a thesis in a University where there is no comprehensive test, written, practical or oral, should not be eligible for teaching appointments.

All persons appointed to the post of Professor in any subject, whether clinical or non-clinical, should have had the necessary post-graduate qualification and not less than four years teaching experience in the particular subject subsequent to obtaining the post-graduate degree, or a minimum of two years teaching experience in the particular subject subsequent to obtaining the above qualification, provided he has had at least 5 years teaching experience prior to obtaining the post-graduate qualification or three years teaching experience after obtaining the post-graduate qualification, if he had had not less than three years teaching experience prior to obtaining the post-graduate qualification.

The following qualifications or equivalent qualifications should be insisted upon :—

Professor of Medicine	..	M.D. in General or Tropical Medicine or M.R.C.P.
Professor of Surgery	..	M.S. or F.R.C.S.
Professor of Midwifery	..	M.D. or M.S. or F.R.C.S. or M.R.C.P. with Obstetrics or Gynaecology as a speciality or an M.A.O. or M.R.C.O.G.
Professor of Medical Jurisprudence	..	M.D. with a special knowledge of Pathology.

Professor of Mental Diseases	..	D.P.M. or a special qualification in Mental Diseases and with clinical experience.
Professor of Ophthalmology	..	M. S. in Ophthalmology or M.S. in General Surgery with Diploma in Ophthalmology and at least four years experience in the Department of Ophthalmology of a Medical College affiliated to a University or F.R.C.S. (with Ophthalmology).
Professor of Hygiene		M.B.B.S. with D.P.H. or B.S.Sc. with teaching experience of four years for the M.B.B.S. Course.
Professor of Pathology	..	M.D., M.Sc. or Ph.D. in Pathology or M.D. in General or Tropical Medicine with at least four years practice in a Pathological Institute attached to a Medical College affiliated to a University, or M.D. in General or Tropical Medicine with the following post-graduate qualification: M.R.C.P. (Edin.) with Pathology.

Registrars : In some States the appellation Registrar is given to those who function like lecturers ; in others to those who function in the capacity of tutors or demonstrators. Where a Registrar is to be appointed, his exact duties should be specified and if they are in the nature of lecturing besides collecting records and giving tutorial instructions to the students, he should be related to the grade of a lecturer. Where his responsibilities are such that he does the work of a tutor or demonstrator, he should be equated to a tutor or demonstrator. The teaching experience will be limited to posts such as lecturers' posts.

Lecturers : So far as lecturers are concerned, preferably only those who have post-graduate qualifications in the particular subject or speciality should be selected. For clinical subjects they must have at least a Diploma in the subject and for pre-clinical subjects an M.Sc. or equivalent qualification.

Student-Teacher Ratio : It is important in an under-graduate medical college to take note of the number of students that can be handled by each member of the teaching staff qualified to do so, so that proper individual attention may be given to the under-graduates. Taking the basic number of admissions to the medical colleges as 100, we feel that as soon as possible the teacher-student ratio inclusive of tutors and demonstrators in each department should be 1 : 5. In fixing the ratio of the number of staff required we had necessarily to take into account the teaching and guidance required for the post-graduate which in most medical colleges will include the instructions at diploma level and M.D. or M.S. in general medicine or general surgery and for post-graduate teaching in the particular subject concerned at a higher level. We feel that the best method of learning is to teach and therefore we recommend that post-graduate students should also be given opportunities for some teaching and professional work under the supervision of Professors. Taking all these factors into consideration we feel that the proportion that we are suggesting *cannot be considered high*. But so far as teachers with the higher qualifications in the ranks of Professors and Readers are concerned the ratio should be 1 : 20.

(l) Number of admissions :

We are of opinion that to get as much of personal attention as possible to individual students, the number of medical students admitted to a college should not ordinarily exceed 100. In exceptional cases, it may be possible to exceed this number, provided the number of trained teachers and other requirements are also increased proportionately.

(m) Teaching Hospitals :

We have at another place suggested that the optimum number of beds in a hospital should be 750 and the maximum 1000 beds. Our view is that more than one hospital properly equipped and staffed should be utilised for the training of under-graduates and that all the students need not be concentrated at one centre during the period of their clinical training. In large towns, it may be possible to distribute the students among a number of hospitals for ensuring the requisite personal attention that could thus be given to them. This presumes, however, that the staff recruited for these other hospitals should conform to the minimum requirements laid down for the staff of a medical college and hospital.

Teaching of medical students in Out-Patient Department : This is a very important aspect of medical education. We feel that considerable improvements are necessary in this direction if the student is to have the full benefit of the variety of cases that are available in the

out-patient department. We are suggesting in another part of our report that the out-patient department should be kept separate from the hospital proper and that it should really be a poly-clinic with all the facilities necessary, namely, x-ray, pathological, bacteriological and biochemical investigations and any other laboratory tests that may be required. From the point of view of sorting out of these cases for instructions to medical students, considerable care should be taken to see that a wide variety of cases are taken on hand for demonstration purposes. We agree with the view that the chief of each teaching unit should spend some time along with his assistants and associates to demonstrate these cases to the students in the out-patient department periodically. Wherever practicable the students themselves should be given an opportunity to take down notes on out-patients and discuss in groups so that familiarity with the manner of approaching a patient and case-recording in the out-patient department may be stressed. In the investigations so carried out by the students, the social and preventive aspects should be taken note of and wherever possible students may be given an opportunity to visit the homes and the surroundings. The days are gone when treatment alone was thought to cure a disease in the absence of preventive measures and care of the convalescent. It is important to stress the social and economic aspects of living which include the housing conditions, the sanitation and the surroundings. In the Chapter on 'Medical Care' we have dealt in greater detail with the facilities necessary for emergency cases, accident cases, orthopaedic cases and the manner in which they may be treated. During the period of training every student should have at least one month's residency training in the out-patient department. So far as larger, especially teaching, hospitals are concerned, it will be necessary to eliminate some of the cases with ordinary and minor complaints.

(n) Man-power requirements :

We may now consider the all-important question of future man-power requirements in the field of health. In this connection, we may draw attention to the extracts of a note on the subject prepared by the Ministry of Health recently (vide Appendix B-27).

In calculating the number of doctors, we have necessarily to take into consideration the pace at which expansion of medical colleges will take place in the country, consequent on the increased facilities which we hope would be given for the starting of new medical colleges, the increased emphasis and support for post-graduate medical education and the increased opportunities by way of suitable emoluments for doctors to settle down in rural areas and in Government service. We have also to take note of the expected increase in population during the period. We feel, therefore, that it would perhaps be a safe target to aim at, to

have one doctor for every 3,000/3,500 population at the end of the Fourth Plan period. If this target can be reached in the rural areas and if doctors are not unduly concentrated in the urban areas, medical relief would have been brought as near as possible to all sectors of the population. We have also to take into consideration the fact that if our recommendations for the use of auxiliary and para-medical personnel are accepted and more of these persons are trained, the services of the doctor would be better utilised for those duties which really fall on a trained medical person. We feel therefore, that, we can assume a moderate amount of satisfactory medical relief being available to all people, provided these considerations are kept in view and vigorously pushed through.

While there is no doubt that appreciable progress has been made since the publication of the Bhore Committee report in every aspect of professional education, it must be conceded that in two respects the progress made has not been proportionate to the demand that has steadily grown. The numbers of doctors, nurses, dentists, pharmacologists and public health engineers along with para-medical personnel are at present not adequate to meet the requirements of the country. In another respect, it has already been pointed out that for manning the training institutions, there has been a deficiency of trained personnel which has to be made good as soon as possible. We have taken note of these conditions in recommending what should be the target to be aimed at during the Third and Fourth Plan periods.

It has also been mentioned that there should be one medical college for at least 5 million population within this period, which would mean, taking the rapid increase in the population into consideration, that there will be 90 medical colleges for the existing population, and for the anticipated population in 1971 the number of medical colleges will have to be nearer 100. Likewise the targets must be fixed proportionately in the case of training institutions for dental, nursing, pharmaceutical and other para-medical personnel.

We have also stated that the bulk of the work both in medical relief and public health should be performed by those who are not necessarily fully trained medical personnel. For this reason, we have suggested that there should be training given at the graduate and post-graduate level in medical and para-medical sciences to some students who have the aptitude so as to be of service in the faculty of medicine. We are glad to note that certain Universities have already taken up this question and efforts are being made to increase the number to be trained at the graduate level. At this level, the training may be given for the usual period of 3 years subsequent to the pre-University course for a degree in science in subjects such as Anatomy, Physiology and Public Health. This training can be given in the medical colleges to selected

students or where facilities are available, in some of the science colleges themselves. Besides this, we recommend the institution of a Master of Science degree which will be available for graduates in science who have taken up Mathematics, Physics, Chemistry, Botany or Zoology. Such candidates can be given the Master of Science degree in Statistics including Bio-Statistics if Mathematics is the subject in which the candidate has qualified, in Roentgenology, Biochemistry, Analytical Chemistry for public health needs, Virology, Immunology, Bacteriology, Pathology, Pharmacology, Pharmaceutical Chemistry and Pharmaceutical Technology if the candidates are graduates in appropriate science subjects, viz. Physics, Chemistry, Botany or Zoology. There is a wide field for useful employment of such graduates and post-graduates both in the Public Health Department and in many institutions for medical relief. To-day, the general criticism both by visitors abroad and by our own inspecting officers is that too much of the time of medical graduates is devoted to routine work which should be done largely by technicians and supervised by persons with qualifications such as we have mentioned above.

We consider that it is very essential that a large number of technicians should be trained for multipurpose duties in the field of medicine. We have referred in another place to the necessity for retaining, even when a particular work is over, those who have been entertained for such duties as anti-malarial work, anti-tuberculosis campaign and leprosy eradication campaign. We feel that if a multipurpose technician is trained, he can be used for any of these works; even if he has had no training in a particular field, it would be easy, after a period of 3 to 6 months training, to orientate him for the duties expected of him. We are of opinion that all district headquarters hospitals and all the larger hospitals with a bed strength of 200 can train these technicians; the period of training may vary from 1 year to 2 years and persons to be taken on for training must be those who have completed their school final or equivalent course.

In certain laboratory investigations and in research projects, there is scope for a wide variety of talent to be entertained. In particular we feel that some of the women who are trained may be usefully employed for such laboratory work.

The necessity to further improve the administrative side of hospitals has been brought home to us. We regret to note that at present medical officers are given too much of responsibility in regard to various aspects of hospital administration which, in our opinion, they need not be burdened with. We frankly confess that unless they get special training in these hospital administrative duties, it would not be correct to expect them to discharge their duties to the best of their ability or to the

satisfaction of those in authority. An experiment has been made in certain States of appointing what are known as lay administrators or secretaries but on the whole the results have not been very satisfactory for the reason that they have not had proper training before they were appointed as lay administrators or secretaries. We gather that in the All India Institute of Medical Sciences at Delhi, a special effort is being made to train such hospital administrators. It would be useful at the present stage to send some well-qualified people for such training where it is best available in foreign countries.

The trained hospital administrator must know his responsibilities and limitations so that he can work in close co-operation with the medical personnel without unduly trenching on their professional duties and responsibilities. There should not be too much of the idea of control and if the person has got the necessary qualifications and experience and is judicious in his methods of administration, there could be no doubt that he can exercise a very wholesome influence on the hospital concerned, relieving the medical personnel of many extraneous duties. In another respect, such hospital administrators, if they are industrious and devoted to their duty, can effect large economies in all aspects of hospital expenditure.

We regret to have to state that at present in the larger hospitals, the conditions with regard to

- (1) the preservation and utilisation of drugs and medical stores,
 - (2) the obtaining of surgical appliances, their proper use and upkeep,
 - (3) the question of dietetic care for the patients and their proper feeding, and
 - (4) the amenities that are required for the patients,
- leave much to be desired.

We have in another place referred to the important part that dieticians can play in hospitals, and in many large institutions where feeding on a large scale has to be undertaken, such as schools, hostels, jails, industrial establishments and generally where large cafeterias have to be maintained for the comfort of the people at work. It is now being realised that it is not the quantity but the quality and the essential constituents of the food that is given which is really of great importance and from this point of view, a record must be available for the dieticians of the nutritive value of the food given both in calories as well as in the constituent factors of that food.

A sad feature in most hospitals is the neglect of the statistical data and hospital records which should serve as very useful and valuable guides both in regard to the care of the patients as well as for the follow-up and for any research to be done.

In teaching hospitals, it is very necessary that the trainees should be properly looked after, whether they be medical students, nurses, dental students or others. The reason for this is obvious. The student population attending these institutions have to come into contact with various diseases prevalent and which have to be treated. Nowhere is there greater necessity than in such hospitals to ensure proper care and sound health of those who have duties therein. We believe that at present there is very little done in this respect in most places and we recommend that special efforts should be made to have a Unit which would be responsible for the preservation of health and prevention of any epidemic diseases. All students working in those institutions should be protected through re-vaccination, by triple-vaccine and other forms of immunisation. It is also necessary to keep a careful record of their health and they must be subjected to periodical medical check-up at least twice a year. This should be considered as part and parcel of the duties of the teaching staff in such institutions.

(c) Number of Medical Colleges :

We understand that there are in existence at present 61 medical colleges with a total intake of about 5,900 students. Taking into consideration the facilities that ought to be available in starting a new medical college, *not merely the buildings and equipment but teaching personnel*, we feel that at the end of the Third Five Year Plan 20 more medical colleges with an intake of an additional 2,000 students would be needed.

In the distribution of the 20 colleges that we have proposed, note should also be taken of a certain amount of equitable distribution as between the States, so that such States as do not have a sufficient number of medical colleges may be given an opportunity to open these colleges.

As far as the number of medical colleges is concerned, the Bhore Committee Report has suggested one medical college for 3 million population. We however, feel that taking all aspects of the situation into consideration, and more particularly the necessity for trained personnel to be available, it may not be possible to conform to this proportion, which we agree may be desirable in course of time. For the present and for the next two Plan periods, however, we feel that it would be more practicable to lay down that there should be one medical college for every 5 million population. These medical colleges should be distributed

in a manner that each State may have a certain number so that the establishment of medical colleges in each State will give a better scope for development of medical relief facilities as well as training of students from that State. We therefore, recommend that while it should be possible to start 20 medical colleges adequately equipped and manned by the middle of the Fourth Plan period, we contemplate the starting of 20 more medical colleges before the end of the Fourth Plan period that will over-flow into the Fifth Five Year Plan. Further development will have to be taken note of by the end of the Fourth Plan period.

Role of the State Governments and Universities: The Committee, after having visited several institutions and having had opportunities of discussing this subject, have to state that unfortunately the eagerness to provide a large number of doctors has resulted in pressure being exerted by the general public on the authorities concerned to start medical colleges. While appreciating the urgency of the need for stepping up of training facilities we feel at the same time that before any medical college is actually started full information regarding all the necessary requirements is in possession of the Government or the authority concerned and that it is only if the Government can satisfactorily fulfil these conditions that the possibility of opening a medical college should be considered by the University concerned. This will, of course, apply to a college to be started either by Government or by private management.

In view of the large number of medical colleges that are now being started, it is considered necessary and desirable that a uniform plan should be laid down before a new medical college is started. The State Government or any other agency which wishes to start a medical college should submit the plans together with the probable resources for equipment, recurring expenditure and personnel to the university concerned, in the first instance. It will be the duty of the university to appoint a commission consisting of teachers of experience to decide whether the conditions are satisfied or not. In appointing the commission the university will be well advised to take notice of the following factors :

1. That as far as possible the commission of experts is drawn from other neighbouring universities or from the field of medical educationists in India.
2. That in regard to certain aspects of medical education, it may be desirable to have an experienced educationist not necessarily a member of the medical profession.
3. Where possible the university may invite the college management to nominate a person to assist the commission in the assessment of the requirements of the medical college ; and

4. Generally the report of this commission should, after approval by the university, be forwarded to the State Government or the management concerned and it is only after a satisfactory compliance with the main recommendations that the starting of the medical college should be approved.

It is observed that certain universities have had to start medical colleges in areas where there were no medical colleges and thus universities stand in the need of a great deal of technical information that should be made available to them. We realise that the chief lacuna will be in the form of trained personnel required for manning these colleges. At another place we have made recommendations as to how the trained technical personnel may be made available. This should be the responsibility of both the Central and State Governments. It is also necessary that the administrative and financial concurrence of the Central Government and the Planning Commission, required under the planning procedures, should be obtained beforehand and we would advise the State Governments not to start new colleges without the approval of the Planning Commission and the Health Ministry.

Lack of Teaching Staff : As has been repeatedly emphasised, the main handicap for starting new medical colleges is the lack of qualified personnel with post-graduate qualification and experience to man the departments. It is for this reason that we have suggested a post-graduate centre, one in each State, besides the post-graduate facilities being made available in some subjects wherever colleges are in a position to satisfy the minimum requirements. If these post-graduate centres are to be started, we suggest that by the middle of the Fourth Plan period every State should have one such centre.

Age of retirement : In view of the shortage of medical personnel, we think in the interest of the general public and the country as a whole it will be very deleterious to retire experienced people at the age of 55 in view of the present trend of longevity of life. One of the ways in which their services could be utilised is to continue them if they are physically and mentally fit, till the age of 60. If the age of retirement is increased to 60 for all persons, then the prospects of the juniors will not be interfered with because they will also have similar prospects in their turn. At present, in a few colleges which have been recently opened, retired personnel have been engaged for a period of three to five years. There is no doubt that certain of these colleges have had opportunities of starting because of these retired personnel being available. The advantage in increasing the age of retirement to 60 will be more particularly appreciated in regard to medical relief in non-teaching centres, where at present officers are retired with little prospects of their

places being satisfactorily filled. On these grounds we would strongly commend the suggestion that 60 should be the ordinary retiring age of any medical or para-medical personnel recruited by Government or other agencies, provided that he/she is physically and mentally fit.

The suggestion that the medical men should be kept on active service till the age of 60 if they satisfy the necessary requirements is not correctly appreciated by some Governments on the plea that this may necessitate the same terms being made applicable to other services also. We would like to state that the conditions of medical service and the need for more doctors are entirely different from the conditions and requirements of other services and therefore it should not be used as an argument in the light of what we have stated that this question is a bar to our recommendations being accepted.

One of the unfortunate features of the difficulty in recruiting medical men to the Services is the low salaries that are being offered to them on the ground that private practice is still allowed. We are definitely of the opinion that in the teaching cadres which we have suggested full-time units must be there with no practice whatsoever. Even in regard to other persons recruited as whole-time Government officers, we would suggest that it is desirable to have a service which will be completely non-practising and which will have such salaries as are commensurate with the academic qualifications and long period of training. We have no hesitation in suggesting that the following minimum scales should be accepted :—

All Professors	Rs. 1,500 — 2,500
Associate Professors	Rs. 1,250 — 2,000
Readers (Asst. Professors)	Rs. 1,000 — 1,500
Lecturers and Registrars	Rs. 600 — 1,000
Tutors and Demonstrators	Rs. 350 — 600

It would be relevant to mention here that the above scales are also in line with the revised scales of pay of teachers in certain of the Engineering and Technological Colleges possessing parallel qualifications and training.

In the Medical Services, those persons who are taken into Government service, whether they do preventive or curative work, should be taken as whole-time officers, without any non-practising allowance and they should be paid the same scale of pay as are applicable to Indian Administrative Service officers. There should not be any special non-practising allowance for medical officers merely because they work on the clinical side.

The Class I scales of pay for those recruited to the general line Class I should be the same as the I.A.S. scales of pay, where it is a running scale depending on the length of service and not on the position. The scale of pay for Class II posts should be the same as held by an individual for Class II posts in the Central Government. The direct entrance to Class I service should be by a competitive examination, 50% of the posts being filled by promotion from Class II.

In this connection, we wish to draw the attention of the authorities to the grants given to engineering and technological institutions both by way of recurring and non-recurring grants for starting new colleges, for equipment, for hostels, for library facilities and for proper scales of salaries for the teachers. We feel that the same principles at least should be applicable to medical colleges started by the Government in the different States. The details of grants given in respect of technical and technological institutions are given elsewhere.

It may be pointed out that so far as post-graduate education in engineering is concerned, the Government of India is giving grants on a 100% basis. This includes provision for revised scales of pay for Professors and others in these institutions which are as follows :

Professors	..	..	Rs. 1300 — 2250
Reader	..	..	Rs. 750 — 1300
Lecturer	..	..	Rs. 400 — 800

Financial Assistance: Under the Third Five Year Plan, the entire cost of post-graduate technological education is to be borne by the Centre, grants being made available through the University Grants Commission. If in the field of Engineering and Technology such liberal grants can be given by the Centre for encouraging post-graduate studies and for the starting of new post-graduate courses, we see no justification for not adopting a similar procedure in the field of medical education. We therefore, recommend that the grants payable in regard to undergraduate and post-graduate medical education should be identical to those paid in respect of engineering education.

In particular so far as post-graduate medical education is concerned, the entire expenditure should be met by the Central Government. Unless post-graduate medical education is developed in the same way as technological education, the whole standard of medical education will not improve.

(p) Construction of Colleges :

In selecting a site for a medical college, it is desirable to bear in mind the possibility of closer contact with Arts and Science Colleges, so that greater co-ordination is established between them.

A Master Plan should be prepared for the site, as construction of a college or a hostel is now a highly specialised branch in Engineering and Medical Administration. Haphazard developments, hurried plans, ill-suited constructions have led to many anomalies which anyone who walks through medical colleges or hospitals can easily see. Therefore there should be a high powered committee with full authority to vet all plans.

In general, when a new hospital is to be constructed, it should be ensured that the site available should be sufficient for future expansion for construction of quarters for the staff — medical, non-medical, nursing, etc. — and so far as teaching hospitals are concerned, the high-powered committee should have on it men with teaching experience and a considerable knowledge of the trends in constructional facilities in other countries.

In this connection, it may be mentioned that at the Conference of Principals and Deans of Medical Colleges in India held in November, 1960, a small committee was formed by the Government of India to examine the methods by which the cost of medical education could be reduced. The above committee made several important suggestions on the subject. It is felt that it is not necessary to build a teaching institution actually within the city limits. In fact, it may be desirable to start medical colleges more in rural surroundings provided of course, actual facilities like electricity, water and roads are available. The campus for accommodating the medical college and hospital should be between 60-100 acres in extent. This would be for construction of hospital, medical college, hostels, quarters for staff and playgrounds. While it is agreed that a medical college may require about 110,000 sq. ft. in the shape of buildings, it will always be desirable to so plan the building that an extension at a later stage may be possible. For easy communication between department and department and between departments and the hospital, it will be necessary to have a 3-4 storied building with lifts. The clinical theatres and demonstration rooms should be available in the hospital or in the out-patient polyclinics.

While considering the cost of construction, the Conference of Principals and Deans of Medical Colleges mentioned that we should either have permanent buildings using standard materials — which would cost Rs. 15 per sq. ft. — or pre-fabricated structures which would cost Rs. 8

per sq. ft. The matter should however, be left to the discretion of State Governments. There is great scope for economy in equipment provided full co-operation and collaboration exists between different departments.

It is particularly desirable that library facilities should be provided in the college building on the ground floor. The libraries have to cater for 3 different types of persons, namely, professors and members of the teaching staff, post-graduates and research workers and lastly undergraduates. The cost of text books may have to be considerably reduced and provision should be made for availability of books for very poor students incapable of buying them. For this purpose, there should be lending libraries as in the U.K., from which books can be borrowed by poor students for periods ranging from 15 days to one month. The libraries in colleges should be kept open for longer periods, in order to enable students to utilise them as best as possible. The libraries should be in charge of qualified librarians.

Hostel accommodation should be provided to at least 75 per cent of the students. Staff quarters should always be available particularly for those who have responsibilities in the attached hospitals.

(g) Revival of short-term courses in Medicine :

We have given considerable thought to the suggestion that as a transitional measure, shorter courses could be given in the Faculty of Medicine. It has also been brought to our notice that in one or two States this step is contemplated. We are in a position to state that the profession as a whole and all Associations connected with the professional bodies in the field of medicine are strongly opposed to the revival of this course. Apart from any such protests, we are convinced that the proper development of the country in the field of health must be on the lines of what we consider as the minimum qualification for a basic doctor. There is another aspect to be taken into consideration. India is no longer isolated and is participating in all problems of international health. The W.H.O. has laid down certain minimum standards of qualifications. In view of India being an active member, participating in all public health measures on an international basis, we think it will be unfortunate if at this stage once more the revival of a short-term medical course is to be accepted. On the other hand we feel that the suggestions that we are making for the training of several categories of para-medical personnel would justifiably meet these demands and in consequence thereof there would be no necessity of a short-term course being revived in any State whatsoever.

So far as problems of rural health are concerned, it has been our experience that such persons trained in short-term courses generally con-

centrate in urban areas and the chances of their settling down in rural areas are remote, whatever may be the terms given to them. Nor do we consider it right that rural areas should be treated on a differential basis from urban areas. If proper care of rural population is to be given, they should get as good facilities as those in urban areas. Our further suggestions in regard to rural health and medical care will be found in the Chapter on 'Medical Care'.

(r) Training of Public Health personnel

It is necessary that a number of medical personnel should be trained at a higher level for taking responsible posts in the public health administration. While we recognise that every basic doctor should have adequate knowledge of public health so that he may function both for prevention and cure, we realise that for community welfare certain higher standards of training are necessary in the field of public health. A large number of highly qualified medical officers in public health would be required to execute measures pertaining to public health and sanitation. The course of training should be given after the basic doctor's qualification and for a minimum period of one academic year. We would emphasise the need in these cases of field training as much as training in the institute itself, and for this purpose we recommend that the trainees should undergo field training for a period of one term of three months during the academic year. Schools of public health may be associated with the undergraduate medical training centres or post-graduate centres.

Public Health School: A School of Public Health will have to cater not only to the training of medical officers in the field of public health but various associated categories of personnel required in the field of public health. We believe that public health engineering should be given every importance. We also feel that sanitarians, public health nurses, M.C.W. workers, dieticians, nutritional workers, epidemiologists, malarialogists and field workers in the various diseases, as well as persons concerned with health education, health statisticians and industrial health workers should have training in a Public Health School, which should be a comprehensive school dealing with all aspects of public health. A Public Health School of the nature we contemplate should have a separate entity, but should work in close co-operation with the undergraduate or post-graduate medical institution in the locality. At least one such Public Health School of a comprehensive nature should be opened in every State preferably within the Third Five Year Plan period.

The persons who are appointed for M.C.W. work should be persons who have had sufficient training in maternity work and later on take a diploma in Child Health. We have given considerable

thought to the proper care of mothers and we feel that the time has come when duly qualified persons trained in Maternity and Child Health must be made available. So far as mother care is concerned it is absolutely essential that only those who have had proper training in midwifery should be entrusted with this work. We therefore recommend that persons who have at least the post-graduate diploma qualification should be appointed. If maternity and child welfare are to be treated together, *persons who hold the D.G.O. should have six months course in child care*, both preventive and curative, and be entrusted with the work.

Qualifications of Public Health Professors in the School: We feel that the Professor of Public Health should be one who has either a post-graduate Doctorate in Public Health or M.D. with diploma in public health with experience as a public health official of not less than five to eight years. We also feel that such teachers must have public health duties and teaching duties in rotation.

One of the senior Professors may be appointed Director of the School. To carry on much of the routine administrative duties, a full-time Assistant Director who has experience in both professional and administrative work should be appointed.

It is necessary that in such a Public Health School opportunities should be made available for higher training and qualification for those who have taken the degree in public health. Higher training should be in the nature of M.D. or Ph.D. in Public Health.

It is to be emphasised that there should be a specialised course of study in at least one particular branch of public health for those who want to take a degree, such as Health Statistics, Epidemiology, Nutrition or M.C.W.

We have referred to the training of undergraduates and post-graduates for certain types of work in several specialities in the Faculty of Medicine. We suggest that the training of a graduate for public health work should also be considered. He will be an assistant to deal with certain aspects of public health and work under a trained public health officer with the necessary medical and public health qualifications.

Public Health Engineering: This aspect of training has been neglected in our country in the past. We believe that to start schemes in regard to water supply and drainage, house construction and environmental sanitation, it is very necessary that there should be a Public Health Engineer to give suitable directions and to supervise. We are constrained to say that the absence of Public Health Engineers has led to a great deal of deficiency in this respect and we feel that

for every municipality there should be a Public Health Engineer available. Such training should be given to those who have qualified for the Degree in Civil or Mechanical Engineering. This type of training is now being given at the All India Institute of Hygiene and Public Health, Calcutta and also at Roorke and Madras.

We consider that a Public Health Engineering Section should be associated with every School of Public Health. A second type of personnel required in this section will be those who are diploma holders of a polytechnic. They will be trained for a year to serve in rural areas and to be of assistance in the urban areas.

Public Health Education : We have referred to several aspects of public health education; we wish now to refer to one additional aspect that may be usefully implemented. We feel that there is scope for a degree in Public Health to be instituted in the University for those who are not medical personnel. A B.Sc. degree in certain aspects of public health could be introduced, and the studies may cover the general public health problems, the nature of certain communicable diseases, methods of prevention of these diseases including immunisation, certain broad aspects of environmental sanitation and public health statistics and also school health service. We visualise the utilisation of such persons in many capacities. They will assist the trained public health workers of the Faculty of Medicine. They can be made responsible to carry on much of the preventive work in municipalities. We would particularly refer to their usefulness in regard to School Health Service.

We think it is very desirable that even in the primary school stage elementary lessons on public health, personal hygiene, etc. should be inculcated in the minds of pupils. The teaching of these subjects should not, however, be divorced from the practical necessity to demonstrate to the pupils the value of the lessons that they learn. We note with regret that in many schools it is not realised that sanitary laws should be taught to the students to be observed in practice. The B.Sc. in Public Health referred to above would be quite in a position to deal with all science subjects pertaining to the school, at least in the middle school stage if not in the secondary school stage. These persons can be utilised for the propagation of health education in schools and colleges and to the general public.

2. Post-graduate Education and Training of Specialists

(a) General remarks :

It is unfortunate that even in the case of the oldest medical colleges in India, for over a hundred years little or no emphasis was laid on post-graduate education and training of specialists. We do not want to go

into the causes of it. Only a handful of people qualify for the M.D. or M.S. in General Medicine or Surgery in India, but the bulk of those who wished to qualify in various specialities had to go to other countries and get training. We hold strongly that the training of post-graduates and specialists is not only important but also urgent for the following reasons :—

1. These post-graduates have to take a prominent place in all the teaching institutions that have been or are to be started ;
2. Today the scientific advances in the field of medicine are such that a post-graduate training is essential even at the district and taluk levels ;
3. India should be self-sufficient, not only in regard to its industrial development, but what is more, in regard to its professional needs and we think that it is high time that all facilities necessary for professional development in the field of medicine as in any other field should be available within the country itself. By this we do not for a moment suggest that those who have had the training should not have opportunities to visit other countries. It will always be to the advancement of science if comparative studies could be made from the better developed parts of the world in regard to any particular subject.

It will be seen from an analysis of the post-graduate courses in Universities undergone by students that the majority of them relate to the clinical fields. While it is necessary that the number of such post-graduates should be kept up, the great paucity of post-graduates in the pre-clinical subjects presents a problem in staffing the medical colleges, new and old. We, therefore, recommend that all persons who are admitted to the post-graduate courses in pre-clinical subjects should be given a monthly stipend of Rs. 250 for the duration of the course. A certain number of stipends should be given on a means and merit test to certain students going for post-graduate studies in clinical subjects. If they have already got a post-graduate qualification in the pre-clinical subjects, such as an M.Sc., and wish to acquire a qualification like the Ph.D. or D.Sc., they should be given a stipend of Rs. 400 per month. It is understood that this is the practice in regard to Engineering and Technological studies and, on the recommendation of the All India Council for Technical Education, the University Grants Commission has accepted these conditions. It is only then that we shall have a number of young and promising medical graduates taking to these higher qualifications.

We have referred in another place to the necessity for whole-time services and a generous scale of pay for all whole-time medical officers, whether in the clinical or pre-clinical fields.

(b) Action^{*} regarding improvement of existing facilities for post-graduate training :

We do not think that every medical college is immediately fit to be a post-graduate centre of training for several branches of studies. We, therefore, recommend that at least one post-graduate institute of medicine should be started in each State and that a particular medical college or hospital should be taken as the focus for such post-graduate training.

We feel that the post-graduate training given in different disciplines should be such that there may be co-operation and co-ordination between the teaching element available for these different disciplines.

We are not forgetting for a moment the aspect of research connected with post-graduate training. We shall deal with that in more detail at another place.

Recognition of existing Institutions as Post-graduate Training Centres : While we concede that some of the existing medical colleges in a State which afford the facilities may be recognised for post-graduate training for the M.D. or M.S. in Medicine, Surgery or Obstetrics, we are of opinion that besides these institutions there should be a separate institution for the development of post-graduate education in all fields of medical sciences. In exceptional cases it may be possible to recognise a teaching institution for some of the specialities, provided the conditions are satisfactory both in regard to personnel responsible and the equipment and other facilities that are required.

An institution may, at the time it applied for affiliation, satisfy all the conditions and possess the necessary personnel, but it is our experience that very soon the institution is not in a position to have the same experienced personnel to continue post-graduate teaching in the particular speciality. We therefore, feel that recognition given to such institutions should be conditional and only when they satisfy both conditions in regard to equipment and personnel should they continue to be recognised. Otherwise the recognition given should be withdrawn till the conditions stipulated are again satisfactorily fulfilled. In other words, no institution should be permanently recognised for post-graduate instruction irrespective of the facilities available there.

We contemplate that by the end of the Fourth Plan every State must have one well-developed post-graduate training centre of the nature mentioned hitherto. But this does not in any way prevent any State Government from proceeding to develop more post-graduate centres with or without assistance of the Central Government.

We would, however, caution against the tendency because of pressure or other considerations weighing with any Government to start

more centres without adequate facilities. This is a matter which should receive serious consideration at the hands of the Council of Post-graduate Medical Education.

We feel that the upgraded departments which were started as a temporary measure have served their purpose and we do not recommend any more upgraded departments. In such places where post-graduate centres have been established, the upgraded departments should be merged with them.

(c) Post-graduate Training Institutions :

On the basis of this general observation we hold that there should be at least one well developed post-graduate centre of training in each State where the number of specialities will gradually develop and post-graduate institutions and hospitals will provide all the facilities necessary. Such post-graduate centres, in our opinion, should be entirely the responsibility of the Central Government at least for a period of ten years, if uniform standards are to be maintained and the requisite training facilities are to be given.

In this respect we would suggest that the present practice followed in regard to arts, science and technological education by the Ministries of Education and Scientific Research and Cultural Affairs giving the grants through the University Grants Commission as lump-sum grants to be distributed on certain well-known principles, may be considered by the Government of India in the Ministry of Health.

Incidentally we may mention that besides the four higher technological institutions in the field of Engineering, the Government of India have taken the responsibility to start, equip and maintain Regional Engineering Colleges where not only under-graduate but also post-graduate education in the Faculty of Engineering and Technology is to be developed on a wide scale.

It is equally important that in the field of medicine the Government of India should immediately take up the responsibility to develop similar post-graduate centres.

(d) Regional Post-graduate Training Centres :

We have mentioned that every State should have one such centre before the end of the Fourth Plan at least. During the Third Plan, we think a beginning should be made to develop at least six such regional centres besides the All India Institute of Medical Sciences, New Delhi.

In Calcutta, the State has started a nucleus of a Post-graduate Centre, but we feel that this should be considerably strengthened for all

disciplines, and taken over by the Government of India as a Regional Centre. The situation at Calcutta should be reviewed in the light of existing facilities so as to make it a full-fledged Centre such as we contemplate at other places.

During the Third Five-Year Plan we recommend that one such Regional Centre should be started in each of the following places:—

Bombay, Madras, Hyderabad, Lucknow and Chandigarh.

A Regional Centre so started would be in a position to cover all the surrounding States till such time as post-graduate centres are developed in each of them. Thus we are of the opinion that the Regional Centre of Bombay should serve the needs of Maharashtra and Gujarat for the time being, the Centre at Chandigarh would cater to the needs of Rajasthan and Punjab, the Centre in Calcutta would be in a position to meet the needs of West Bengal, Bihar and Assam and the Centre at Lucknow would cater to Madhya Pradesh and Uttar Pradesh, while the Centre at Madras would serve the needs of Madras and Kerala and the Centre at Hyderabad would cater to the needs of Andhra Pradesh, Mysore and Orissa. As we have stated elsewhere, it is our hope that with these developed Centres, the Government of India would be in a position to start a post-graduate centre in each of the other States within these regions.

Admission to these centres should be on a regional basis, so that the seats available would be open to the graduates of the States concerned in the first instance.

There are two ways of thinking about the development of a post-graduate centre. One is to develop a post-graduate centre purely for the training of post-graduates and specialists; and the other to have a small under-graduate section associated with the post-graduate training centre, as it obtains in the All India Institute of Medical Sciences, New Delhi.

The development of post-graduate education is best fostered in Centres where post-graduate studies and research are mainly concentrated, as in Hammersmith and similar places. The training of the teachers of medical colleges should be in such centres after they have obtained post-graduate qualifications.

The training centres should be well-equipped and staffed by competent and experienced persons with whole-time units in particular subjects. At such post-graduate centres it is desirable that under-graduate education should also be imparted till such time as it is possible to have separate under-graduate centres or colleges. We visualise the

possibility of gradually limiting the number of under-graduates to 50 in each such post-graduate centre as a transitional measure.

Till such time as each State can have its own post-graduate centre, well-established and well-equipped, we feel that centres that may be opened in any of the States should cater to the needs of the neighbouring States. Even after fully developing the post-graduate centres, there should be the possibility of graduates from various parts of the country and even from abroad being admitted to undergo post-graduate education and to take part in research activities. It will be necessary to make efforts to see that the selection of post-graduates is on a wide basis.

While the Regional Centres will serve the needs of the States included in the region, it is desirable in view of the fact that these centres are recommended to be completely supported by the Government of India that a certain proportion of the seats should be available on an all-India basis. We suggest that 80% of the seats be filled by candidates from the States in the region concerned in proportion to the number of under-graduate medical seats available for admission, and 20% of the seats be made available to candidates from the remaining States of India. When each State has got its own post-graduate centre, this proportion will obviously be 80% for the State concerned and 20% on an all-India basis. We are suggesting these figures as in the large majority of cases, students may find it difficult to migrate for financial reasons from one State to another to undergo the same post-graduate education and to have the same facilities as are available in their own State. In case however such post-graduate facilities are not available in any specialised branch of study, the selections must be on an all-India basis subject to the proportion already mentioned.

In the filling up of the posts of teachers in the post-graduate centres, the posts must be duly and widely advertised and selection committees appointed for the purpose. Existing teachers and members of the staff should also be considered for such posts.

In any particular State, if it is not possible to convert any of the existing medical colleges into a post-graduate centre, such as we have suggested, a separate post-graduate centre may have to be developed. So far as post-graduate instruction is concerned, there should be, in these places, a separate set of teachers who would undoubtedly get assistance wherever an under-graduate medical education centre exists, from the qualified teachers connected with under-graduate instruction. In this connection, we quote the fundamental requirements for post-graduate training in Surgery laid down by the American College of Surgeons :—

1. "Graduate training in General Surgery or in any of the Surgical specialities should be of sufficient duration and educational

content to enable the young surgeon upon completion of such training to begin the practice of surgery in a scientific manner. An acceptable programme should include an approved internship of three or more years of organised institutional graduate training.

2. "The medical staff shall be organised with heads of departments and an Educational Committee responsible for the organisation of the graduate training programme and for the personal supervision and direction of the work of the resident staff.
3. "The application of the basic medical sciences must be emphasised in the clinical work. In addition the resident staff shall be required to observe and participate in autopsies, to devote adequate time to the study of gross and microscopic pathology, to acquire a practical knowledge of clinical roentgenology and radiology, to pursue anatomical studies including regional dissections, and to participate in clinical and experimental research or in other special study of the basic medical sciences. The hospital shall maintain a clinical laboratory and X-ray department and other adjunct diagnostic and therapeutic facilities essential for diagnosis and treatment.
4. "The hospital shall provide a medical library containing a wide range of standard text-books, current medical journals and periodicals, with a librarian in charge. The resident staff shall take an active part in general staff meetings, departmental conferences and clinico-pathological conferences, and shall be responsible for some teaching activity. A definite programme of reading of scientific literature shall be carried out under the guidance of the medical staff."

It is our hope that the Post-Graduate Medical Council which is being established may be in a position to bring home these necessities and to lay down these requirements as fundamental considerations for all post-graduate training in the Faculty of Medicine.

(c) Selection of subjects for post-graduate training :

In selecting the subjects for post-graduate training at any centre, the emphasis should be, besides the equipment and organisational aspect, on the qualifications of the teaching staff. Unless that staff is available, the particular branch of post-graduate study should not be opened.

While the Universities will take note of the recommendation of the Post-Graduate Medical Council in this regard, it is necessary in determining the number of students to take into consideration the facilities available for training in the associated disciplines connected with the particular speciality.

An integrated system of training with practical experience in a particular speciality should be available to every post-graduate and a record of the training given should be maintained in the institution concerned.

In all centres where post-graduate training is given, emphasis should be laid on the training of basic sciences depending on the particular post-graduate course that is selected. In the case of the surgical specialities, emphasis should be on the study of Anatomy besides Physiology, Biology and Pathology. Likewise in Medicine the emphasis should be more on Physiology, Cardiology, Bacteriology and Biochemistry. These subjects should be learned in an integrated manner and practical application for every one of the subjects studied must be emphasised. For the examination, we suggest that there should be some questions on the applied aspects of these subjects in relation to questions at the clinical examination held for the post-graduate students.

Such post-graduates should really fulfil the role of personnel dealing with the active practice of the speciality in the hospital concerned.

In the case of pre-clinical and clinical laboratory subjects, we recommend that the first post-graduate qualification, namely, M.Sc., may be taken if facilities are available at the different teaching institutions affiliated to the University; but in the case of higher qualifications like the Ph.D. and D.Sc. we consider that it may not be desirable to take them at colleges other than the recognised central post-graduate institutions which we have suggested. In exceptional circumstances where a college has got a high grade professorial staff available and the University and the Post-Graduate Medical Council recognise such professors, the institutions concerned may train for Ph.Ds. in the respective subjects. Once these institutions are recognised, then all existing upgraded departments will be merged gradually or will cease to exist.

Admission to these institutions need not necessarily be limited to the post-graduate stipendiaries, but others who are eligible to post-graduate studies and are willing to undergo studies on their own should also be entertained. The number that should be admitted to every unit should be determined by the extent of teaching personnel and other facilities available and the nature of the speciality.

(f) Basic qualifications for post-graduate training in specialities :

So far as the qualifications required for the post-graduates are concerned, while in the majority of cases they will be recruited after

the basic qualification we feel that in certain specialities a higher qualification is necessary. We, therefore, suggest the following :—

Master of Surgery for Neuro-surgery, Thoracic surgery, Plastic surgery, Orthopaedic surgery and Genito-urinary surgery.

Doctor of Medicine for Neurology, Paediatrics, Psychiatry, and Cardiology.

It is desirable in certain other subjects also to have a basic post-graduate qualification before specialising. Such subjects like chest diseases may come under this head and as developments take place in the medical sciences, it will obviously be necessary to include other subjects as well.

In general, however, so far as these specialities are concerned, we think it is much better that a preliminary post-graduate qualification of a diploma nature should be a requisite qualification in most of the subjects where higher qualifications are desired.

In particular we feel that in Ophthalmology and E.N.T., Obstetrics and Gynaecology, Paediatrics and Anaesthesia a person should first take the Diploma course before going for post-graduate degree. Anybody who wants to undergo training for any post-graduate qualification must have had housemanship for one year which we have recommended as compulsory before registration.

(g) Selection of post-graduate candidates :

In selecting candidates for post-graduate training, preferential treatment should be given to :—

- (a) those who have obtained prizes and medals in the University Examination ;
- (b) those who have passed the M.B.B.S. examination in the minimum period ;
- (c) those who have shown special aptitude for any branch of medicine ; and
- (d) others who are considered suitable on their academic qualifications.

We feel that the selection of post-graduates is of great importance and we suggest that a Committee should be appointed to select students for each centre. This Committee will consist of the Vice-Chancellor of the University where the centre is situated and preferably three to five Principals of the Medical Colleges in the region by rotation and one

representative of the Central Government and the Director or the Deputy Director of Medical Education of the State Government by rotation every year. In our opinion, the Vice-Chancellor of the University should preside over the Selection Committee, but if he is not available he should depute a senior educationist in the University to take his place. The head of the post-graduate institution should act as Member-Secretary of such a Selection Committee. The Vice-Chancellor may coopt the Principals in the region for the Committee. Where there is more than one University in a particular State, it is for consideration whether the Vice-Chancellor who is to preside over the Selection Committee may be appointed for a term of three years so that by rotation the Vice-Chancellors of other Universities in the State may also get this opportunity.

The Selection Committee should consider all candidates irrespective of whether they are in service or otherwise. Till such time as each State has got its own post-graduate centre, we think the proportion of post-graduates should be on the basis of the number of seats available for the undergraduates course. Merit must be the sole consideration in regard to selection from each State. If the total number of seats are not filled up in any particular regional centre then persons from other parts of India who fulfil the necessary requirements can be selected on merit to that extent for the particular year concerned.

So far as candidates from other countries are concerned, it should be open to the Centre to allot a few seats for qualified candidates from other countries in addition to the number fixed.

Post-graduate students should be treated as members of the staff and should be expected to do all types of work.

(h) Stipends :

We recommend that a large number of stipends should be available for those candidates who take post-graduate studies in these zonal centres. The stipends should be given for the minimum period of study required for post-graduate qualification.

(i) Number of admissions at Post-graduate Training Centres :

The number of students to be admitted in a Regional Post-graduate Centre should be regulated by the facilities that are available for a particular discipline.

(j) Qualifications and Salary of Professors :

We have suggested for appointments to the posts of Professors for under-graduates that experience in teaching should be insisted upon. For Professors for post-graduate studies, the minimum teaching experience should be six years.

We feel that for a Professor of a Post-graduate Training Centre, the scale of pay already suggested for Professors in under-graduate institutions should be augmented, so that he can get Rs. 2,000-3,000. An Additional or Associate Professor should get from Rs. 1,500 to Rs. 2,500.

(k) Post-graduate diploma courses :

We advocate the post-graduate diploma for two reasons. In the first place it will help in spreading to a certain extent a more specialised form of trained personnel than the basic doctor, to the different parts of the country, so that they can settle themselves in district and taluk headquarters hospitals or in Primary Health Centres and be of better service to patients. We feel that these shorter-course-post-graduates, who have a special aptitude and requisite ability, can pursue the higher studies for the Master's or Doctorate qualification in the particular subjects. These higher courses will be useful in training institutions and certain of the big district hospitals to man the departments concerned.

In the branches of General Medicine and General Surgery, while we have advocated the granting of the M.D. and M.S. under certain conditions, we realise that a few persons may not attain the requisite standard but if as we hope and expect the requisite training has been given in the practical aspects of these branches, their services will be of greater use particularly in the non-teaching institutions. We feel that such persons if they satisfy the examiners so far as the standards are concerned, may be given a certificate on the same lines as the certificates given to Graded Specialists in the Armed Forces Medical Services. They will, however, be eligible again to appear for the Degree qualification in the subject concerned.

(l) Training abroad in certain Specialities :

We have stated already that as far as possible, proper facilities for post-graduate education and for specialist training should be available in this country in all disciplines in the faculty of medicine. Till however such facilities are available, in some of the specialities it would be necessary to send to suitable centres abroad persons well qualified to benefit by such training. The centres so chosen should be well-recognised international centres where the requisite facilities will be available to Indian students.

There is another suggestion which we wish to commend to the Government and to Universities. There have been occasions when teams of experts have visited this country and participated in seminars and discussions at one or other of the University centres for periods ranging from a few weeks to a couple of months. Some years ago, the World Health Organisation sponsored the visit to India of a team of experts

in different branches of medicine. They spent three weeks at each of the centres, Madras and Bombay, discussing with the professorial staff and enthusing the students also in regard to methods of clinical teaching and laboratory work. We consider it is of great advantage for such arrangements being mutually agreed upon between Indian Universities and some of the foreign Universities. We understand that one Indian University has come to an agreement with a Canadian University for teams to be sent out so as to work along with their counterparts here for certain periods and for some of the promising younger members of the teaching profession in the Indian University to go to Canada so as to benefit by the methods obtaining there for clinical instruction and research. We commend this example to the other Universities and to State and Central Governments. We feel that when such persons from abroad make their visits or when our own personnel are sent abroad, generous assistance should be given by the State and Central Governments so as to enable them to function in the respective countries. The larger the opportunities for our post-graduates and junior staff in teaching institutions to visit different countries and to familiarise themselves with methods of approach for clinical instruction and research, the greater will be the benefits derived. We hope therefore that there will be a generous measure of support through teaching fellowships, deputation and study leave, for such persons to go abroad and per contra for inviting professors from other countries to visit the different Universities in our country for periods ranging from a few weeks to an academic year.

(m) Health and Welfare of the student population :

It has been emphasised by the World Health Organisation that medical students required particular care in regard to their health not only because of their strenuous course of training but by their being forced to come into contact with diseased conditions both contagious and others, and therefore, it is all the more necessary that their health should be protected during the course of training. This involves proper hostel accommodation and necessary facilities being made available to check up their health conditions from time to time. It should largely devolve on the teaching element to supervise the health and welfare of the students, both under-graduates and post-graduates. Where a medical student — post-graduate or under-graduate — falls ill he ought to get free treatment and accommodation in the hospital concerned. Special accommodation should be given to such medical students in separate wards. A careful record of the health of the individual students should be maintained in the college concerned throughout the college career and records must be taken at least once a year and in special cases twice a year.

on a large scale but, if the staff can be provided, the Pathology Department can act as a subsidiary to other civil institutions in times of emergency.

(b) Army School of Health, Lucknow :

This school is intended chiefly to train non-official officers and other ranks in elements of hygiene and their application in daily life. The facilities available can be easily extended, within the limits of the existing training capacity, to the health staff of Primary Health Centres or welfare workers in the region so that they can be trained in such essential health measures as provision of safe water supply, disposal of night soil and insecticidal measures.

(c) School of Aviation Medicine :

The School of Aviation Medicine was established in 1957 at Bangalore. The School runs courses for various types of personnel in aeromedicine. Certain items of research work have also been undertaken by the School and as soon as necessary equipment and building facilities are provided the scope of the School will increase in order to cater for the growing requirements of aeromedical backing for the fast developing Air Force as well as for the Aircraft industry in India.

(d) Research :

For medical research in the Defence Services, there is a Research Advisory Committee to which civilian specialists are co-opted. There is a personnel Research Panel, presided over by the Director General, Armed Forces Medical Services, which controls investigations on the environmental, physical, psychological and nutritional problems applicable to the Defence Services. In all research activities liaison is maintained with civil institutions like Indian Council of Medical Research and others.

There is a virology section in the Pathology Department of the Armed Forces Medical Corps. Extensive research on Rickettsial diseases had been carried out during the last war. This was continued after the termination of hostilities. Laboratory and field investigations have added to the knowledge of the epidemiology and etiology of the typhus group of fevers. The presence of 'Q' fever, ornithosis and histoplasmosis in India has been established by workers in this Section. It is understood that research schemes, seminars and conferences which would be of benefit to both the civil and defence medical services have been hampered on account of financial and other limitations placed upon them for the reason that the Defence Ministry cannot appropriately incur

expenditure on projects from which the civilian health services may also benefit. It is highly desirable that such barriers should be lifted.

(c) Radio Isotopes :

Under the joint guidance of the Director General, Armed Forces Medical Services and the Scientific Adviser to the Ministry of Defence, research on biomedical aspects of radiation is being carried out by a control cell since 1956. Diagnostic and therapeutic aspects of radio isotopes are being intensively studied.

It is gratifying to note that the Defence Medical Organisation, dependent largely upon U.K. for training and research before Independence, has made very creditable progress towards self-sufficiency in many directions. This is as it should be. The Armed Forces have their own peculiar needs which must be met. We must, however, guard against any trends towards exclusiveness or duplication in fields of training and research. It is neither necessary, nor can we afford to have parallel research organisations. It should be possible to secure better results by pooling the resources for research. Also in the matter of the basic training of doctors, the Armed Forces should draw upon the normal source of supply rather than institute their own training programme at this level. For more reasons than one, a career in the Armed Forces Medical Services should be one of the normal openings for the products of all medical colleges instead of a few being trained exclusively for the Army.

4. Recommendations on Dental Education

(a) Under-graduate :

The Committee, taking note of extreme scarcity of qualified dentists in the country and the comparatively small number of dental graduates being trained at present, considers :

- i. that the outturn of the existing dental colleges should be doubled ;
- ii. that the number of dental colleges should be increased in a manner so as to provide a minimum of one dental college for each State ; and
- iii. that necessary facilities should be provided for the training of dentists registered in Part B of the Dentist Register for being registered in Part A thereof.

Post-graduate :

To achieve this result, it would be necessary to increase the facilities for post-graduate dental education, and it is suggested that additional facilities for post-graduate training of dentists should be created, apart from those existing at certain centres at present. The post-graduate Training Programme should be so geared as to provide within the course of the next few years the requisite number of teachers in the Dental Colleges.

(c) Dental Hygienists :

Realizing the time lag that is likely to take place in the production of adequate number of fully qualified dental surgeons and the setting up of fully-staffed dental services, the Committee feels that as an immediate step the training of dental hygienists should be undertaken at all the Dental Colleges. If 50 Dental Hygienists are admitted to the training course at each of the 10 Dental Colleges, it should be possible to produce within a period of 5 years about 2,500 Dental Hygienists.

5. Para-medical personnel

(i) Nursing :

(a) Grade of Nursing Personnel :

So far as nurses are concerned, there should be three grades of nurses :

- (1) The basic nurse with 4 years training including six months in midwifery and six months in Public Health ;
- (2) The auxiliary-nurse midwife having two years' training ; and
- (3) The nurse with a degree.

At the same time facilities should be available for the basic nurse to be able, under specified conditions, to get higher qualifications. Similarly the auxiliary-nurse-midwife may be given opportunities under specified conditions to work for the basic course of nursing after putting in 3 years' work.

(b) Basic qualifications for and duration of Nursing Courses :

All students who are to be admitted in the general nursing course should have passed the school final or matriculation examination or an equivalent examination and should undergo training for a period of four years. At the end of the 3rd year there should be six months' training.

in Obstetrics and Gynaecology and six months in Public Health orientation. The minimum period of training in midwifery should not be less than six months.

The candidates for the degree will have a course of training for a period of four years after the Higher Secondary or Pre-University.

Those who have taken the degree in nursing must have a minimum period of three years of service in general nursing before they are given special duties or posted as specialists like sister tutors, etc.

(c) Age of admission :

Although we recognise that the age fixed by the Nursing Council for entering the nursing profession, viz. 17 years, is very desirable, taking into consideration the developments in various States and the necessity to secure for the nursing profession a large number of recruits of suitable educational qualifications we think that as a transitional measure, we will be justified in recommending that the age can be relaxed to 16 in suitable cases, particularly in those States where difficulties have been experienced in recruiting candidates at the age of 17.

(d) Medium of Instruction :

The language in which the candidates could be taught may be the language which is the medium of instruction at the Secondary School, provided approved text books and competent teachers are available. But at the same time, we feel that the medium of instruction through English should also continue for such as can benefit by such teaching. So far as candidates for the Degree course are concerned, we are of opinion that English should be the medium of instruction.

(e) Nurses Training Programme :

In regard to training of nurses, we agree that the nursing programme outlined by the Trained Nurses' Association and Nursing Council is sufficient for the purpose. We would, however, suggest that the present practice of using nurse-pupils for doing all the routine duties in a hospital and not concentrating on training and practical experience, is not desirable. We agree with the Trained Nurses' Association that the duties allotted to the student nurses should be specific and that in carrying out these duties emphasis should be given to the training programme rather than to the discharge of other incidental duties in the hospital. At the same time, we feel that the practical work that is to be done ought to be emphasised.

(f) Nursing Schools :

So far as nursing schools are concerned, we feel that there is now a great scope for utilising a larger number of hospitals for training of nurses. All district headquarters hospitals and all hospitals with a bed strength of 75 to 100 should be utilised for nurses training, provided facilities are available there for both surgical and medical nursing and paediatric nursing. The number of probationers attached to these hospitals would depend on two factors, viz. the total number of beds and the personnel available for giving them both theoretical and practical training. While theoretical training may be given by both medical and nursing staff, practical training should largely be the responsibility of the senior nursing staff working in the hospitals concerned. The minimum number of students in any Nursing School, part-time or full-time, should be 12. Separate provision for midwifery training may be made at midwifery centres if the hospital concerned does not have the necessary facilities.

(g) Facilities to Nurse Trainees :

We are also of the opinion that as student nurses they should not at that tender age be subjected to too much of night duties in the hospitals concerned and they should have periodical rest. The proposal that they should work for 48 hours on a six-day basis recommended by the Trained Nurses' Association is, in our opinion, a fair method of giving them the necessary training. The tendency in hospitals at present, to utilise the services of the probationers for the purpose of reducing the number of qualified staff nurses that ought to be available in such hospitals, is a retrograde step and is not conducive either to proper attention being given to the patients or to the efficient training of the probationers.

Every probationer should be provided with fully furnished accommodation in a hostel located within the hospital campus or as near it as possible. While building new hospitals, a condition should be imposed that a hostel for nurses under training, as well as staff nurses, should be provided as part of each hospital. Secondly, free board, free supply of uniforms and laundry arrangements should be provided as also free medical services including medical check-up twice a year with maintenance of records and hospital care in separate wards for nurses.

It is necessary, considering the nature of work and the environments in which the work has to be carried out, that nurses and probationers should have recreational facilities available to them.

In addition to the above, probationer nurses ought to be given a graded scale of stipends with a minimum of Rs. 35/- increasing by Rs. 10/- every year.

(h) Scales of pay — Ratio of Nurses to Hospital Beds :

So far as the scale of pay and ratio of nurses to hospital beds are concerned, the recommendations contained in the Report of the Nursing Committee set up by the Central Council of Health, known as the Shetty Committee, are generally acceptable. Extracts from the Shetty Committee Report are given in Appendix B. 29. The number of auxiliary-nurse-midwives should be based on the requirements of the population and gradually phased in such a way that at the end of 15 years there will be one auxiliary-nurse-midwife available for every 5,000 population.

(i) Nursing School Advisory Committee :

Each Nursing School should have a Nursing Advisory Committee which will be responsible for advising on the care to be taken of nurse probationers and on their health and welfare. We agree, generally, with the recommendations of Trained Nurses' Association as to the method of recruitment and the constitution of the Nursing Advisory Committee in each Nursing School. Such committees may consist of the administrative head of the hospital, the Nursing Superintendent, one senior Sister Tutor and two lady members, one of whom should be a non-medical educationist.

(j) Budget of Nursing Schools :

We agree that there should be a separate budget for the nursing school. This budget should include not only the expenditure to be incurred on the nursing probationers, but provision of audio-visual aids and library facilities on nursing subjects as well as general reading material, to help to get the nurses trained in the habits of studying.

Text books should be supplied free to every student according to the year of study.

As an interim measure till the hospital selected can conform to the full requirements of a nursing school, it may be necessary to train the nurses in the first half of the period in some of the selected hospitals and then to give them further training for the full nursing course in a recognised hospital provided accommodation is available.

(ii) Training of Auxiliary-Nurse-Midwives :

We feel that for a long time to come, it will be necessary to have a second grade of training given to certain persons to fulfil certain duties of the nursing profession. It is for this purpose that we recommend the continuance and extension of the training of auxiliary-nurse-midwives. The candidates should at least have the middle stage of secondary

education and should put in two years of training in selected hospitals. They should have essentially a good 18 months training in midwifery and a certain amount of training in general sick nursing. The present syllabus and practical training prescribed by the Nursing Council would appear to meet these ends. The auxiliary-nurse-midwife trainees should be given the same facilities which have been suggested for the nurse trainees, such as, accommodation, stipends, free board, uniform and books.

(iii) Training of Midwives :

As an interim measure, where a rapid development of excellent midwifery training may not be possible, the present system of training for midwives may be continued. These midwives should gradually replace the dais who are now being utilised at certain places. The institutions used for training of midwives should, however, be subject to inspection by the Nursing Council and subject to approval by the Government concerned. Such institutions should have a minimum of 50 beds and the number to be trained should be fixed for each institution.

(iv) Health Visitors vs. Public Health Nurses :

We understand that at present the health visitors' training consists of an additional six months to one year to those who have qualified as midwives. Candidates are expected to have passed the matriculation examination. The present course of training of the health visitors has, however, not fully justified itself, considering the responsibility attached to a post of that description. We feel that the time has come when health visitors should be recruited from the general basic nursing category. We, therefore, consider that there should be fresh thinking on the type of training given to such persons and their designation, bearing in mind that their essential duties are connected with the preventive aspect of medicine.

We therefore, advocate that such persons should have a basic nursing qualification and one year's further training, which will include domiciliary visits and public health aspects of preventive medicine in communities. Such trained persons, will be of the greatest assistance at all levels—district and taluk and even primary health centres. We therefore, feel that they should be called Public Health Nurses and should replace the present type of Health Visitors.

(v) Training of Dais :

The Bhoré Committee had made the following comments in regard to the training and use of dais :

"The continued employment of these women will, for a period be inevitable. While recognising that attempts to train the dai and make her reasonably satisfactory in the practice of midwifery have in many cases failed, the discrepancy between the existing number of midwives and that required to meet the needs of the country is so great that, as an interim measure, the possibility of elaborating a system of training whereby the *most effective use might be secured out of this type of personnel* cannot be ignored. We have described in some detail the experience that one of us (General Hance) has had in developing a midwifery service through trained dais in the North-West Frontier Province where the scheme achieved a reasonable measure of success. We also understand from another member of our Committee (Dr. Dutt) that attempts to improve the normal practice of midwifery by dais through suitable training have been equally successful in the Punjab. We have, in the circumstances, advocated the training of dais as an interim measure until an adequate number of midwives will become available and have made certain suggestions for their training for urban and rural practice."

We feel that conditions are still not very different in certain States since the report by the Bhore Committee. It has been brought to our notice that the prejudice against trained midwives does exist even now in certain parts of the country and therefore, it will not be possible to *replace the dais immediately*. On these grounds we recommend the continuance of the training of dais as a temporary measure. But only those who are recognised as dais in the locality should be selected for training. In the meantime, every effort should be made to see that as soon as possible sufficient number of midwives are trained.

(vi) Post-graduate & Post-certificate training for Nurses & Auxiliary Nurse Midwives :

We have given the different categories of nursing personnel that could be trained. We feel at the same time, that any person who has been trained in one category should have an opportunity of being trained at the highest level, under certain conditions to be specified by the All-India Nursing Council. Besides these nursing personnel, a large number of *post-graduate courses will be required for a variety of purposes*. We have in view the higher training of the general sickness nurse for positions like public health nurses, paediatric nurses, mental nurses, theatre sisters, sister tutors, nursing administrators, etc. The nature of training and the conditions under which such training should be given

should be determined by the Nursing Council. As other specialities develop, it may be necessary for the basic nurse to be trained for neuro-surgical nursing, thoracic nursing, plastic surgery nursing and others.

We feel that general basic nurses should have five years' experience of general nursing duties after passing before being sent to any of the special courses. Those who are qualified in a degree course should have three years of general nursing duties as staff nurses before they are taken for the post-graduate training.

Psychiatric nurses should be trained in large numbers to staff mental institutions. Besides the facilities that now exist at Bangalore for the training of psychiatric nurses, provision should be made for this purpose in the Mental Hospitals at Madras, Ranchi, Bombay, Agra, Amritsar and Hyderabad. Some of the nurses trained in psychiatry should be sent for the Sister Tutor's course at Delhi, in order to enable them to carry out their functions effectively and to train others in their respective institutions.

(vii) Appointment of Nurses to Higher Posts :

The present practice of posting qualified Degree course nurses directly to responsible posts immediately after qualifying either as tutors or ward sisters or any of the higher categories will not be in the interest of the nursing profession or of the general public. Promotion to posts of higher responsibility should be considered in the case of Degree Nurses and Basic Nurses only after practical experience of a minimum of three and five years of experience, respectively, after qualifying.

In regard to those who have had midwifery training, while we agree that their services will be useful in many hospitals, all those who are posted to training centres or to maternity hospitals used as training centres, should have an additional six months' practical training in midwifery before they take up any responsible duties.

(viii) Male Nurses :

Male nurses should be trained only for certain types of work, e.g., for mental hospitals, for work in the theatre, for Army Hospitals, Rehabilitation Centres, V.D. clinics, but essentially nursing training should be given to women candidates who come to the nursing profession.

(ix) General observations :

We have one observation to make at this stage. We have referred to the various categories of training in the nursing service for which we feel that women would be essentially required. This would

necessitate some rethinking as to the manner in which the available material in the country is utilised. We do hold that if sufficiently attractive terms are given to young girls they would rather prefer the nursing profession than being recruited as Lower Division Clerks or employed in similar clerical services under Government or private agencies in the country. If certain types of duties can be performed effectively only by women, it would obviously be necessary in the interest both of the individual concerned and the nation that the resources are properly channelled for the successful completion of the targets we have in view. It is not for a moment suggested that we should put any sort of handicaps in regard to the employment of whatever category it may be, but we think that if conditions are made suitably attractive for the important profession of nursing, in which women have to play a large and leading part, it would not be necessary for them to take up other duties.

At the secondary school stage there must be a certain amount of diversity, for girl students e.g., training in fundamentals of physiology, home nursing and first-aid, nutrition and cookery.

6. Training of other para-medical personnel

(i) Medical Auxiliaries :

Besides medical personnel and nursing personnel, there is an urgent need for different types of medical auxiliaries to help doctors and public health workers in various fields. Among the groups that may be mentioned under the medical auxiliaries are chiropodists, dietitians, laboratory technicians, occupational therapists, physio-therapists, radio-graphers, remedial gymnasts, almoners, dental hygienists, and dental mechanics.

(ii) Auxiliary Health Workers :

We feel, taking into consideration the needs of the country, that there is a necessity for training a separate class of personnel called auxiliary health workers. The training that should be given to these auxiliaries should be mainly in the field of public health. They should not only assist public health officers but also be of service in the detection of some of the communicable diseases and in measures that may have to be adopted for their eradication, and for health education and vital statistics. Such personnel will be of help to the primary health centre doctor in immunisation and in first-aid practice, in relieving him of some of his present routine duties and also in reporting about the condition of the environmental sanitation of the localities concerned.

(iii) Further training of B.C.G., Leprosy, etc. workers :

For these purposes, we have in view the possibility of giving further training to those who have already been recruited for individual diseases, such as B.C.G., leprosy, malaria and filaria control. We feel that as some of the above mentioned diseases get eradicated, the auxiliary workers who have sufficient basic knowledge can be given further necessary training in some of the subjects referred to in the earlier paragraph and enrolled as auxiliary medical or public health or dental workers. They will thus become multi-purpose personnel and can be attached either to the urban or the rural centres according to the needs of the situation in any State.

(iv) Qualification and duration of training :

The qualifications that would be required of these personnel will be that they should have read up to the S.S.L.C. or equivalent standard. The duration of further technical training may be two years.

(v) Utilisation of Auxiliary medical or Public Health workers :

We feel that where a sufficient number of trained personnel in other fields are not available, or even when doctors are not available, these persons will be of much assistance to the primary health centres or the sub-centres. These auxiliaries could be posted to work under the direction of the primary health centre doctor either in the main centre or at the sub-centre. The initial qualifications and the period of study must, however, be uniform in all States. Details of such personnel requirements will be found in Appendix B. 30.

The regulations for the courses and the prescription of standards in all branches should be laid down by the Faculty of Medicine. For graduates in nursing, facilities may be made available for higher training in certain branches by post-graduate nursing institutions.

We have come to the conclusion that it is not only in regard to aspects of medical care, but in regard to various other types of work now being performed by medical men that relief can be given by para-medical personnel so that medical men may be more fittingly employed to the specific responsibility that belongs to them. In this connection, we have noted with satisfaction that in one of the Universities a Bachelor's Degree is made available in a large number of subjects allied to the medical field.

(vi) Training in Hospital Architecture :

Schools of Architecture should provide facilities for training in hospital architecture. The Public Health Engineering Department recom-

mended to be set up in each State should have a cell in hospital architecture with an architect who has received training in this branch. It is felt that in order to induce architects to take up training in hospital architecture, it will be necessary in the earlier stages to offer inducements by way of fellowships for taking this course. It should be the primary function of the Architectural Section at the Central as well as the State Directorates to evolve standard type designs of hospitals of various sizes and of laboratories, hostels and training centres. As a part of this work, it will be desirable to have standard lists of equipment and other requirements for these institutions, in the manner in which these are maintained in the Armed Forces.

(vii) Utilization of qualified technicians retired from the Army :

The Committee's attention has been drawn to the fact that a variety of technicians, pharmacists, sanitary inspectors, etc. are discharged from the Armed Forces every year. Either on account of their basic educational qualifications or their technical training being of a standard less than that required in the civil posts, this trained potential is at present being wasted. At least until such time as the required number of trainees are turned out by each State to meet its demands, there seems to be no reason why the discharged Army personnel as categorised in Appendix B. 31 should not be employed in the State Health Services, either by relaxing the required standards for a period of 5 years or so, or by appointing the ex-service personnel after giving a short course of training to make up the deficiency. If this is done, it would make it easy for the setting up of Rehabilitation Centres in the States of which there should be at least one in each State and Limb-fitting Centres of which there should be 5 on a regional basis. For the latter, the personnel trained in the Army Limb-fitting Centre, Poona and the School of Physical Medicine at Bombay, could be utilised.

CHAPTER IX
MEDICAL RESEARCH

CONTENTS

1. Bhore Committee's findings.
2. Developments in the last decade.
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4. *Recommendations.*

1. Bhore Committee's findings

In a review of the field of research, the Bhore Committee had felt that the Medical Research Department cadre, insufficient as it was, at the time, was not being used to the best advantage. The Committee had also observed that in the central as well as provincial research institutes the demands of manufacture were crowding out research activities in most of these institutions and that the facilities for progressive development of research in many of them were either inadequate or lacking. The Committee had indicated broadly the lines on which reform in the various research institutes was, in its view, called for. Analysing the causes of the lack of research in the medical colleges in the country the Committee had suggested importation of research workers for short periods, the appointment of Associate Professors for research work in the medical colleges to be financed by a central research organisation, the institution of a programme of exchange of professors, appointment of at least one full-time member of the staff to be in charge of research and co-ordination in each medical college, the organisation of periodical group conferences of the teaching staff, the provision of adequate equipment for research and award of scholarships to promising medical and science graduates to enable them to acquire proficiency in research methods and to pursue research careers. The Committee had also recommended that in addition to the creation of the All India Institute of Medical Sciences, post-graduate training institutes at different provincial centres and special centres for diseases like cancer, leprosy, mental health, etc.

In regard to the Indian Research Fund Association, the main organisation charged with promotion of research, the Committee observed that while the Association had done valuable work in promoting the setting up of research institutes, the scope of research work carried out was within rather narrow limits. The Committee recommended that the research organisation should consist of a Scientific Advisory Board and an administrative body. The latter was to serve as a link between the Government and the board and to supervise the working of the organisation. The functions of the new research organisation were to be : (a) formulation of the policy of development and co-ordination of research, (b) stimulation of research in medical colleges and university centres, (c) the selection and training of research workers, (d) the constitution of expert advisory committees, and (e) the promotion and financing of research programmes. The achievement of these objectives was recommended to be attained by (1) institution of scholarships for medical and non-medical scientists, (2) attachment of workers of standing to suitable medical institutions where the young scholars would be associated with experienced teachers and research workers, (3) the grant of overseas scholarships, and (4) the appointment of associate professors.

2. Main developments in the field of Research in the last decade :

The developments that have taken place in pursuance of the above recommendations of the Bhole Committee may be summarised as follows :

Changes in the Central and provincial research institutes have been carried out as far as possible to facilitate the development of research activity in them. Methods have been developed for the manufacture of new biological products, like the yellow fever and influenza vaccines. Separation of the manufacturing from the research aspects of the activities has either been carried out or is in hand. The Malaria Institute of India has played a notable role in the Malaria Eradication Programme, in organising Filaria control, in providing training at various levels to the field staff in malaria and filaria and in conducting extensive field investigations. It is intended on the conclusion of the eradication programme to develop the institute into a Communicable Disease Centre. The School of Tropical Medicine, Calcutta, has been reorganised with the Central Ministry of Health represented on its governing body. The All India Institute of Hygiene and Public Health has been greatly expanded and reorganised, many new courses of training have been instituted and research in many problems in its field of work undertaken. The Haffkine Institute has been expanded, the separation of the research and manufacturing cadres has been undertaken. Production of virus vaccine for various diseases such as Kyasanur and oral polio vaccine is under consideration. A Committee to enlarge the scope of the activities of King Institute, Guindy, is going into this question. The Pasteur Institutes are carrying on research in rabies and on other viruses. All these institutions are participating in the investigation of public health problems in their respective fields.

Many new research institutes have, in the meantime, come into existence. Research in regard to cancer is being carried out in some centres. A Leprosy Teaching and Research Institute has been set up in Chinglepet, Madras. The Mental Health Institute at Bangalore, the Chest Institute at Delhi and the Virus Research Centre at Poona are others which have since come into existence. The Nutrition Research Institute has been shifted from Coonoor to Hyderabad where it has physical and other facilities to pursue its work on an extended scale closer to a university centre. The Council of Scientific and Industrial Research has set up the Central Drugs Research

Institute at Lucknow and the Public Health Engineering Research Institute, Nagpur, besides taking over the Indian Institute of Biochemistry and Experimental Medicine at Calcutta. As an interim measure, pending the development of full-fledged post-graduate facilities at the All India Institute of Medical Sciences, upgraded departments for post-graduate teaching and research in anatomy, obstetrics and gynaecology, radiology, venereology, chest diseases, pathology, plastic surgery, paediatrics and history of medicine have been set up in selected medical colleges in different parts of the country.

3. The Indian Council of Medical Research :

The Indian Council of Medical Research came into existence in 1950 as the central medical research organisation recommended by the Bhore Committee, by taking the place of the I.R.F.A. The objectives of the Council are to prosecute, co-ordinate and assist research primarily in communicable diseases, to finance enquiries and research projects, to exchange information with other institutions similarly engaged and interested, to prepare and publish reports of research work, papers and periodicals and to grant fellowships. The Council's Governing Body is presided over by the Minister for Health and comprises the Secretary, the Director and Deputy Director General of Health Services, the Director-General of the Council of Scientific and Industrial Research, three Directors of Research Institutes, the Director-General of Armed Forces Medical Services, three representatives of Parliament and three representatives of the Medical Faculties of the Universities. It has a Scientific Advisory Board under the Chairmanship of the Director General and 15 members representing experts in scientific fields, Directors of Research Institutes, etc. The initial scrutiny of research projects is carried out through 14 Advisory Committees and 22 sub-Committees. Although the research projects are screened and funds allotted on a year to year basis, the Council is trying to develop broad five year plans of research projects. The Second Five Year Plan schemes were intended largely to cover the gaps in knowledge in the fields of nutrition, malaria, other communicable diseases, indigenous drugs, M.C.H. and clinical research. The broad motivation of the Third Five Year Plan research projects will be provided by the work in connection with communicable diseases, cardiovascular diseases, research in indigenous drugs and fundamental research. The existing procedure of the Council in inviting proposals for research work is to subject the proposals to a scrutiny in the first instance in the Directorate of the Council, after which the Advisory Committees scrutinise the research projects with a view to satisfy themselves that the project covers new ground, that it is scientifically adequate, that the necessary facilities are available and that the budgetary

provision asked for is reasonable. The proposals emerging from the Advisory Committees are presented to the Scientific Advisory Board and with the recommendations of the latter to the Governing Body in the order of priority indicated by the Advisory Committees. In the light of the experience of the working of this system greater need of expert groups in the different disciplines rather than of heterogenous advisory committees has been felt. Another handicap has been the dearth of experts competent to examine and comment on the various schemes. It has also been the experience that too many schemes have had to be screened in too little time by the Advisory Committees and the Scientific Advisory Board.

During the past decade 19 research units have been assisted by the Council. Apart from this the main bulk of research activities has been through the medical colleges. The rotation of the annual meetings of the Council in different colleges and the opportunity provided to professional associations like those of pathologists, etc. to meet at the same time, are stated to have gone a long way in stimulating interest in research. 169 fellowships to junior teachers have been given to enable them to pursue post-graduate and research training in selected departments of colleges. The tables below give the number of research schemes financed by the Council since 1950-51 and the quantum of medical research effort in the country.

*Statement showing the number of research schemes
financed by the Council since 1950-51*

Year	Continuation Schemes	New Schemes
1950-51	48	12
1951-52	54	22
1952-53	53	34
1953-54	62	33
1954-55	63	36
1955-56	59	57
1956-57	91	77
1957-58	149	153
1958-59	210	69
1959-60	203	*
1960-61	145	47
1961-62	126	74

* No new scheme was sanctioned this year as the Governing Body was reviewing the whole programme with a view to reorientate its policy of financing medical research in the country.

Progress in the quantum of medical research effort in the country

Year	Total number	Expenditure incurred Rs.	Number of medical colleges participating
1940-41	53	6,42,932	8
1945-46	48	7,28,627	4
1950-51	60	14,73,996	7
1955-56	116	28,46,314	19
1960-61	200	50,08,417	28
1961-62	200	55,00,000	30
(Approximate)			

19 special reports have been published by the Council since 1948. The Council has helped the Central and the State Governments in communicable diseases field research notably in leprosy, filariasis, tuberculosis, trachoma, kysanur disease, encephalitis, poliomyelitis and gastro-enteritis epidemics.

4. Our Recommendations

We have given a summary of the recommendations of the Bhole Committee in regard to this subject and also the subsequent developments in this field and the manner in which research work is being carried on. We have stated that the research work that is being done is largely due to the initiative and the assistance given by the Indian Council of Medical Research, such assistance being available to institutions and individuals in the country. There are certain developments that are contemplated in regard to the I.C.M.R. about which we shall deal later. Looking at the whole background of research in this country, we are convinced that, if the medical profession is to occupy the place it ought to in the international world, the contributions made in the field of medical research are as important as contributions in other fields and India cannot all the time be a debtor country in this respect. Fortunately India may claim justifiably, to have taken a leading part in medical research among Asian countries and to have contributed substantially in certain definite fields to the knowledge on the subject. Thus, it can be said that the research work that has been done in India has been outstanding in respect of certain of the communicable diseases like plague, malaria, cholera, kala-azar, leprosy and other tropical diseases, although more work is still needed concerning some aspects of these diseases. It is however, necessary to realise that as things are progressing in the world, the part that India will be expected to play in the field of research

is very much greater now than has been the case in earlier periods. Research, therefore, should form a prominent part in the nation's activities in the field of medicine. We feel that the time is come when great importance should be given to research and the manner in which facilities may be made available for carrying out research.

Research Institutions :

In the past there were established certain research institutes which had some definite functions. Among these may be mentioned the Haffkine Institute, Bombay, the All India Institute of Hygiene and Public Health, Calcutta, the Central Research Institute, Kasauli and the King Institute at Guindy, Madras. These institutes were originally started with a view to carry on research in the problems in which the country was most vitally interested and to be largely responsible for the research in particular types of diseases common in the regions concerned. It was also laid down that the sera and vaccines required for immunising the population against certain of these diseases should be prepared at these institutes, as at that time the technical personnel required were available only at such centres. Gradually it was found that these activities at the Institutes became the dominating feature of the work of these Institutes both in regard to the extent to which they had to be expanded to meet the requirements of the country as well as the need to supply the Governments of the different States with these products at a reasonable cost. In other countries the process of production has now passed on to the hands of commercial concerns; but we feel that at present it is not a practicable proposition in our country. While, therefore, we realise that these activities will have to be continued at such centres for some time at any rate we are of the opinion that they must not be the predominant feature of these Institutes but that their main function as centres for research must be revived.

We do realise that in the very process of manufacturing these products, many research problems arise and therefore the final control of this part of the activity must be in the hands of the Director concerned who could at any time be in a position through appropriate teams to continue further research. The manufacturing side should be a separate wing of the Institute manned suitably with trained staff but under the overall supervision of the Director. But apart from such technical aspects of research, we hold that these institutes should be the main source for two types of research activity, viz. (a) fundamental research dealing with certain main problems and research in regard to certain aspects of diseases which may be referred to the institute concerned; and (b) field research to make available to the State concerned valuable data on certain epidemiological conditions or on certain rare diseases

which may spring up or on problems which arise in the very process of giving effect to remedial measures suggested for certain diseases. It is now well-known that the process of eradication of certain diseases has led to many other problems arising therefrom.

While we recognise that for the time being it would be necessary for some of the manufacturing processes to be continued at the place where they are at present being undertaken, we feel that the manufacturing side should be kept separate and the research section should not have responsibility for the manufacturing side except in regard to quality testing, standardisation and further research. Ultimately we hope that the production side will be taken over by the private sector subject to quality testing being done by an independent organisation responsible to the State. We shall deal with this when we come to the chapter on Drugs. We are aware that under the Drugs Act, there is provision at present for testing of samples but we are of opinion that there should be a central laboratory to which sera, vaccines, and all biological products wherever they may be produced should be sent for testing.

Another aspect of the question which we feel these research centres must usefully take up is to be in close touch with international organisations of research in all countries and it should be their endeavour not merely to co-operate in such schemes of research as may be undertaken in international centres but also to serve the very necessary purpose of disseminating the latest information in regard to causation of disease, methods of treatment or measures for the eradication of these diseases. In regard to collection and dissemination of information pertaining to research in different fields, it would be useful if the I.C.M.R. would be the central organisation to collect such information from international sources and make it available to the profession through the institutes that we have referred to.

We hold the view that this will mean considerable strengthening of the trained personnel that is available at such centres.

Research in Medical Colleges :

The next point we have to consider is in what other respects we may encourage research in the country. It has been repeatedly emphasised and it is well-known in educational circles that the medical colleges cannot divorce themselves of the responsibility for carrying on some kind of research and that the best teaching is imparted in those colleges where there is an academic atmosphere of research so that at an early stage of the medical student's career, he may be brought in touch with problems of research and be made to interest himself in such problems. From this point of view, the medical colleges in the country have to

serve as research centres and every encouragement should be given to them to fulfil such a function.

At present, the handicaps are many. We do realise that in most colleges the time that the medical staff have to spend both in attending to the interests of their patients and in giving the necessary instruction to their students is such that they find very little time for research. While this may be so, we are constrained to say that any teacher who is genuinely interested in research will always find it possible to devote a portion of his time for such research; and if the teacher in a college is really interested in research, it cannot be said that there are not opportunities for him to carry on such research. We are glad to be informed that a beginning in this direction has already been made by the I.C.M.R. and centres have been selected for this purpose.

It has, however, been brought to our notice that in matters of research, assistance from various disciplines both in the Faculty of Medicine and in allied faculties is essential; that it would be necessary in most fields of research to have the help and co-operation of the departments of Bacteriology, Pathology, Biochemistry, Public Health, Radiology, etc. and that these departments, being overworked with duties which are far more extensive than the duties they are expected to discharge for the hospital concerned, are not in a position to take on the burden of the additional investigations required by the research workers in the college. We are ourselves convinced that this is the case in the large majority of colleges, and that these departments are utilised much more for the routine work that is to be done in the college and the hospital and even for other hospitals in the State. The difficulty is accentuated because most of the colleges are inadequately staffed.

Taking all these into consideration, we feel that it would be exceedingly useful if a research unit can be set up in every medical college which will help in the investigations necessary for purposes of research. Such a unit will have pathological, bacteriological and biochemical sections, besides such other sections as may be necessary for the particular investigations that have to be carried on.

It is also necessary to realise that in many cases, animal experimentation is an essential part of research. We, therefore, feel that in such medical colleges, there should be an animal house for keeping and breeding different species of animals required for experimentation. Such experimentation may be with reference to problems connected with medicine or surgery. Such experimentation stations are to be found in Edinburgh, Montreal (Canada) and many other places. In Montreal, there are facilities for separate operation theatres on a small scale for such animals in the top floor of the college buildings. This is a matter which

requires some consideration. We would, however, like to state that the animal house contemplated is not merely a shed for animals but will approximate to conditions where hospital treatment is given to such experimented animals.

We would, in this connection, suggest that every post-graduate centre which we have recommended should have all the facilities for carrying on research. There should also be a separate ward of 10 to 15 beds available for research purposes. Such a ward should have special nurses to look after the patients and for periodical observation and maintenance of relevant records.

We feel that every medical college and research institute in the country should have a separate budget specifically earmarked for carrying on research. A statistical section should be attached to the institutes where a large amount of research work is carried on.

It is understood that the I.C.M.R. is also sponsoring schemes for research in indigenous drugs in several medical institutions and extension of this activity is being thought of.

Liaison between other University Departments and the Medical Faculty :

We feel that wherever it is possible there should be close co-ordination and co-operation between the University Departments of Science and the Departments of Medicine. In many cases it would be useful to interest such University Departments in the problems that are being studied by the teaching element of the medical colleges. Thus the Departments of Physics, Chemistry, Mathematics, Botany, Zoology and Biochemistry can be of the greatest service in co-operating with the Departments of Medicine or Surgery in regard to such research problems.

The question of personnel is very important. While we do expect the teachers in the medical colleges to interest themselves in these problems and do research in their respective fields, we also feel that they require help from trained research workers or persons who have an aptitude for research. It is well known that in any field of research, a good deal of routine experimentation has to be done and records maintained. While, therefore, the guiding hand should have suggestions to offer, it should be possible for others who are being trained to carry out these investigations and present them in suitable form.

We are glad to learn that it is contemplated by the Indian Council of Medical Research that a certain number of Fellowships should be given with a view to helping medical colleges to extend their research activities.

The Indian Council of Medical Research :

We may now refer to the role of the I.C.M.R. in research programmes. Prior to independence, there was an all-India institution for the promotion of research called the Indian Research Fund Association but the Association was largely limiting its activities to certain centres and giving a few grants to individuals for research. On the whole, the work of the Association did not contribute materially to the rapid advancement of research in the country. The Indian Council of Medical Research, which was constituted in 1950, has however, done a great deal to promote research in the country. We have no doubt, that but for the activities of the I.C.M.R., several of the problems that have been undertaken would not have been touched at all. The I.C.M.R. has as its objectives the following :—

1. The prosecution and assistance of research, propagation of knowledge and experimental measures generally in connection with the causation, mode of spread, and prevention of diseases, primarily those of a communicable nature ;
2. To initiate, aid, develop and co-ordinate medical scientific research in India and to promote and assist institutions for the study of diseases, their prevention, causation and remedy ;
3. To finance enquiries and researches ;
4. To exchange information with other institutions, associations and societies interested in the same objects, and specially in the observation and study of diseases in the East and in India in particular ;
5. To prepare, print and publish any papers or periodicals in furtherance of the objects of the Council and to contribute to any such periodicals ; and
6. To grant fellowships, scholarships, etc. for training research workers and to offer prizes in order to encourage research pursuits.

While we fully endorse the objectives that the I.C.M.R. has, it would be necessary to consider whether in the present state of development in the country, the entire responsibility should be cast on the I.C.M.R. to be the sole body for stimulating and encouraging research. We feel that the time is come when the Governments at the Central and State levels, should realise their responsibility to a much larger extent and should be in a position to contribute finance and to foster research in the different States.

We also feel that in view of the large expansion of the research programmes that we are recommending, the time has come when some fresh considerations to the re-constitution of the I.C.M.R. should be given. In this connection we would invite the attention of the Government to the proposals that have been accepted and are now working well in Great Britain and other foreign countries. We would therefore recommend that in considering this question the constitutions of the Councils for Medical Research of other countries should be studied and the I.C.M.R. reconstituted in the light of the experience gained by them.

The researches that have to be carried on may be classified under the following headings :—

1. Researches of an international nature where research workers in this country will be actively associated with similar research workers in other countries. Thus, in the study of cancer, for instance, or of diseases like influenza, or in regard to such subjects as hazards of atomic radiation where research work is being carried on in many countries, India also should take its proper place and contribute towards the solution of these problems. We are glad that India has already made notable contribution in the case of cancer research.
2. National research programmes: These relate to problems common to the whole country and here a number of research centres in the country can simultaneously investigate and co-operate in correlating the results achieved. Thus in regard to the control of some of the communicable diseases like cholera, plague, smallpox, filariasis and leprosy, it is very necessary that research should be encouraged wherever possible.
3. Zonal or State problems: There are certain diseases which are confined to some of the regions where research has to be carried on owing to the prevalence of disease conditions in the respective regions only. We would refer for instance, to the existence of goitre, guinea-worm disease, fluorosis in particular regions. These problems have to be tackled by research workers in the area concerned.
4. There are general problems of research connected with various other diseases or pathological conditions which may have to be tackled at many centres of research.

While we are appreciative of the assistance that the I.C.M.R. has been rendering both in regard to technical advice and in regard to financial grants to various centres, we think the time is come when the Governments at the Centre and in the States should take the responsi-

bility for making available suitable grants to research centres, particularly to research organisations which have been established already and to medical colleges and University centres where such research must be encouraged. We would suggest that research should be promoted in the post-graduate centres which we have recommended.

We would suggest that in each State a small committee should be constituted to consider research programmes and to recommend adequate grants which should be given by the State Governments. We are of the opinion that a permanent allotment should be made for this purpose to the different institutions, teaching or otherwise, which are expected to carry on research. The expenditure on the equipment, drugs or appliances that have to be made available and the staff that has to be appointed for the particular purpose must be met by the State Governments. We are of opinion that the State Governments should be responsible for making available a grant to each college for research purposes.

A Cadre of Research Workers :

Research is a tender plant and it must not be pulled out by the root to see whether the plant is growing ; sufficient time should elapse before results are obtained and conclusions drawn therefrom. Besides the grants that are to be given by the Central and State Governments, which should include grants for fellowships, studentships, and for certain additional posts that may be required, we feel that the time is come when, in the larger interests of research in the country, there should be established an all-India cadre of research workers. These must be persons chosen from trained workers for research who have shown an aptitude for research and they should devote their whole time to research problems in the country. They will be the top grade of research workers attached to any centre or persons who will be posted to carry on field investigations so that the cadre will be largely responsible for early spotting of any disease conditions, analysing and reporting on the causation thereof, the methods of prevention, etc. We are glad to note that an all-India cadre of research workers has been sanctioned by the I.C.M.R. We entirely agree with the I.C.M.R. as to the category of research workers and the salaries that ought to be paid to them. Apart from individual teachers who would be expected to launch upon research work, it would be important to have this band of research workers who would make research their career throughout their life. Such a cadre should also include the Directors and a few of the senior members of the research institutes now in existence and will form a reserve for the supply of trained research workers to research institutes on the lines of the original Medical Research Organisation. They must be assured of security and advancement in their own line of pursuit.

The scales of pay should be such as to attract young talent to make research a lifelong career.

Methods of selection should be so revised as to ensure that only the best ones are taken into the Cadre.

This however, will not mean that the Indian Council of Medical Research has not a vital role to play. We have only referred to certain devolution of financial responsibilities and administrative matters but the responsibility for stimulating research in the country will largely vest with the I.C.M.R. The constitution of Scientific Advisory Boards, the setting up of expert committees, the matter of diffusing information and contacting similar organizations in other parts of the world will all form part of the duties of the I.C.M.R. In fact, we would suggest that this Council should be considered as the most informative body to control and guide research throughout the country.

Machinery for evaluation :

One other aspect of the question has to be considered seriously. In many cases, experiments are being carried on in the country, for instance, the use of the B.C.G. in tuberculosis, the smallpox vaccine, and the anti-polio vaccine that is now being utilised in some parts on a fairly large scale. Whatever may be the method adopted for the eradication of certain diseases or the control of other diseases, it is necessary to have *from the start an evaluation committee appointed which committee will draw up the manner in which from time to time the results of these operations can be recorded and interpreted.* Too often in the past, a particular scheme has been adopted and work undertaken but without the necessary evaluation so that at the end of a long period no definite conclusion has been arrived at regarding the success or otherwise of the scheme. We have today many such problems in India. We have referred to the problem of tuberculosis — domiciliary treatment, B.C.G. vaccine and various other aspects connected with tuberculosis. It would be very desirable to have an evaluation committee from the very start of any process of implementation of the methods recommended. Likewise in the case of leprosy, smallpox and many other diseases. This evaluation committee must be of an all-India pattern and we feel that so far as the steps to be taken by the evaluation committee are concerned, such as the maintenance of records, the questionnaires that may have to be issued and the formulation of the method of assessment, the I.C.M.R. *would be the proper authority to give guidance for these evaluation committees.* We hope and trust that these evaluation committees will hereafter be started at the commencement of any particular project.

While the I.C.M.R. will give advice and guidance in regard to methods to be adopted by the evaluation teams, the working of the evaluation teams and the expenditure therefor should be part and parcel

of the particular programme for which the evaluation committee is appointed.

We feel that such evaluation committees should be constituted not only in the field of medicine but in many other projects such as the Community Development projects.

Industrial Research :

So far as industries are concerned, there are two types of research work urgently needed. One type of work is for the industry itself in order to improve the methods of production or with reference to other projects connected with the industry. We note that certain of the industries have such research units attached. Thus, with regard to the textile industry, a very good beginning has been made by the Research Associations started at Ahmedabad, Bombay and Coimbatore. Likewise it would be very necessary to start industrial research centres for other main industries.

But apart from the research that is to be carried on for the industry itself, the more important problem connected with the health, welfare and safety of the industrial workers merits serious consideration. In all big industries, there must be one or more units for carrying on research in regard to industrial health and welfare of the population. The expenditure for such research must come largely from the industry itself. What we have in view is the type of industrial research carried in certain of the western countries, in Philadelphia for instance, where the Department of Public Health in cooperation with the staff of Preventive and Social Medicine in the medical colleges carry on research work both by investigation of the personnel in their natural environments and by setting up artificial establishments where they study what the causes are that lead to disease conditions. While the constitution of such research centres must devolve on the industry, if need be in cooperation with the Employees' State Insurance Corporation, we feel that the technical advice and assistance should be forthcoming from the Council of Scientific and Industrial Research and the Indian Council of Medical Research.

We notice that several departments of the Government take different responsibilities in regard to health and welfare of the people and of the employees of the various departments. We feel that the resources of all the Ministries should be pooled together for ensuring the health and welfare of the citizens. We do not consider it desirable that there should be compartmental system of health measures in various departments, such as Railways, Labour, Industry, etc. We feel that there should be co-ordination at the highest level and the intermediate level to ensure best utilisation of funds for schemes relating to health.

CHAPTER X
THE POPULATION PROBLEM

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1. Recommendations of the Bhore Committee and present position

Although the Bhore Committee drew attention to the implications of the trends of population growth and suggested action to be taken in this behalf, the full-blooded "National Family Planning Programme" today is a far cry from the faltering and half-hearted recommendations of that Committee in regard to population control. This is indeed, as it should be, if we consider that the rate of increase of population per cent which was 6.4 between 1901-1911, 10.6 in 1921-31 and 13.6 in 1931-41 has increased to 21.5 in 1951-61. The population of India stands today at more than 436 million as against 360 million in 1951. Coale and Hoover made the following projection of the population increase and income per adult as compared with 1956.

Year	Assumption regarding Fertility conditions	Estimated population in millions	% of population increase as compared with 1956	Income per adult consumer (Rs. per annum)	% of increase in income as compared with 1956
1956	Present level	384	..	341	..
1986	(a) If the present level continues	775	about 102	382	about 12
	(b) Reduction by 50% between 1966 and 1981	634	about 65	494	about 45
	(c) Reduction by 50% between 1956 and 1981	589	about 53	573	about 68

It will be seen that at the present rate of growth at the end of 25 years, the population increase would be of the order of about 102% as against 13.5% increase in income. Even with a 50% reduction in the rate of population growth between 1966-81 the increase in income will still not catch up with the increase in the population. The Family Planning Programme has, therefore, rightly come to occupy a key position in the Five Year Health Plans. The urgency of the problem is already widely recognised and we do not consider it necessary to dwell at any length on the need of an organised drive on a national scale for arresting the present rate of increase in the population of the country.

A word of caution will not, however, be out of place here in so far as some reasonable time must elapse before the measures being undertaken at present begin to show palpable results. It may be mentioned here that the population demographic cycle follows certain well defined patterns. The first phase is characterised by high birth and death rates. In the transition from this to the second phase, the first impact of improved social organisation is on the death rate, a reduction in which without a corresponding decrease in the birth rate leads to a population increase. We along with some neighbouring countries like Indonesia and some South and Central American countries are in this phase. In the next phase there is a further reduction in the death rate but the birth rate also begins to show a downward trend. The rate of population increase still remains high. U.S.S.R., the Eastern and South European countries may be said to be passing through this phase. This is followed by a decrease in the birth rate leading to a state of near balance between births and deaths. Such a state of balance may be said to exist in U.K., Germany and Australia etc.

The object of the family planning movement in India is to accelerate the shift from the second to the fourth phase by planned effort to bring down the birth rate, without waiting for this consummation in the normal course of time through the play of the normal social and economic processes. Some time lag is therefore inevitable, particularly when the organisation of such a programme involves reaching hundreds of thousands of villages and has to contend with problems of social habits, ways of living, religious scruples, inadequacy of living accommodation and changing the sense of values of the people.

Our main concern in this movement has therefore to be with the ways and means for bringing about in as short a time as possible an impact on population growth. In its very nature the problem presents a great challenge. It concerns itself with the way of life of the people in its most intimate aspects. There is no precedent of a mass movement of this nature anywhere else in the world. What India can accomplish in this direction is, therefore, not only a matter of vital importance to her own economic and social well-being but can also serve as a lesson to many parts of the world which, if not faced with the population problem of the same dimensions today, are all the same bound to come up against a similar situation sooner or later, if the present trends of population increase in many other countries are any indication.

2. Family Planning Schemes in the I and II Five Year Plans

The family planning movement can be said to have emerged on a national scale in the II Five Year Plan. Although it figures in the First Plan, the actual work at this stage was mostly that of planning

and preparation. There were four main lines of activity namely, service, training, education and research.

Service :

21 rural and 126 urban family planning clinics were set up in the First Plan Period. In the Second Plan 1,079 rural and 421 urban clinics came into existence. Of these about 100 were set up in association with medical colleges and training centres for medical auxiliaries. About one-third of the maternity and child health centres are equipped to give family planning advice and assistance. It is estimated that about 50 lakh couples were contacted by the family planning teams and over 10 lakhs actually given advice and appliances relating to birth control. The distribution of contraceptives is being extended through Primary Health Centres, hospitals, dispensaries and maternity homes. It is reported that the sale of contraceptives had increased six times between 1958 and 1959. Of late facilities for sterilisation have been set up in some hospitals and mobile sterilization teams have been established at some other places. For this purpose, separate units have been set up in some hospitals for attending to cases of sterilization, subsidies on a per capita basis are being given at other places for sterilization operation, and mobile surgical units are in the field holding sterilization camps from place to place. It is understood that about 1.32 lakh sterilisation operations on males and females with the object of family limitation, have been carried out till the end of June, 1961.

Training and Education :

In regard to training and education, training centres run by the Ministry of Health have been established at Bombay, Ramanagaram and Delhi. A pilot training team has been formed by the Family Planning Association of India with financial assistance from the Government of India. In addition to this, many State Governments have set up regional training centres. Grants have also been given to a number of non-official organisations for undertaking programmes of training of family planning workers.

Instruction in regard to family planning methods has been incorporated at the instance of the Medical Council of India and the Indian Nursing Council in the curriculum of the courses of training of doctors and nurses. Nearly 3,000 persons are understood to have received training so far under the various training schemes. More than 2,000 school teachers in various States have been orientated under the Community Development Family Planning Scheme. Honorary family planning education leaders have been appointed for motivating the people and mobilising public opinion in favour of family planning, several lakhs

of copies of posters, pamphlets and folders are stated to have been prepared and distributed. Films and cinema slides also form a part of the programme of education.

Research :

Investigations on contraceptives are being carried out at the Contraceptive Testing Unit, Indian Cancer Research Centre, Bombay, All Indian Institute of Hygiene and Public Health, Calcutta, the Central Drugs Research Institute, Lucknow, the Institute of Post-graduate Medical Education and Research, Calcutta, the Bacteriological Institute, Calcutta and the Pharmacology Department of the Lucknow University. A number of oral contraceptives have been investigated. The preliminary results of investigation at the All-India Institute of Hygiene and Public Health, Calcutta, on an oral contraceptive "Metsxylo-hydroquinone" are encouraging. Demographic and biological research has been carried out in association with the Indian Council of Medical Research. A Demographic Training and Research Centre was established in Bombay in 1956. In addition to this, 3 Demographic Research Centres have been set up at Calcutta, Delhi and Trivandrum. A Demographic Advisory Committee has been set up at the Centre and a Committee on research on the physiology of Human Reproduction has been set up by the Indian Council of Medical Research.

A Central Family Planning Board consisting of eminent social workers and leaders of public opinion has been set up with a subsidiary Standing Committee. A Director of Family Planning serves as the chief executive for the family planning programmes as a part of the organisation of the Central Directorate of Health Services. Similarly Family Planning Boards have been set up in almost all States. Officers have also been appointed at the State level who are either exclusively or largely concerned with the control and supervision of family planning work. The expenditure on Family Planning in the First Five Year Plan was Rs. 65 lakhs, the amount provided in the Second Plan was about Rs. 5 crores and the amount provided in the Third Plan is Rs. 20 crores.

It is considered too early to come to any conclusion with regard to the effectiveness of the methods employed for propagating the movement of population control. The fact that a wide sense of awareness of the problem has been created and also the resistance of the people of the acceptance of family planning advice and methods has been broken to a much greater extent than was envisaged originally, may be assumed to be clear indications that the initial phase of the family planning programme has been completed successfully.

It should also be mentioned that by a limited investigation made in New Delhi, where intensive family planning work has been done for

some years at a stretch, it has been brought out that the pregnancy rate in the population has been markedly reduced. A brief report of this study will be found in Appendix B. 32.

Whether the movement in its present form can be expected to yield the desired results within a reasonable period of time or whether a change in approach would become necessary is an important question.

3. Recommendations

(i) Agencies for carrying out Family Planning Programmes :

We have given considerable thought to the suggestions made from time to time for the *setting up of an autonomous authority* which would receive grants from the Government for carrying out the family planning programme but would not be handicapped in its work by the disabling requirements of Government Rules and Regulations. It has been contended that if the family planning movement is to produce early and successful results, it has to be in the nature of a mass movement and that for this purpose governmental agencies may not be able to develop the necessary momentum or inspire the requisite amount of public support and enthusiasm.

We feel that voluntary and social organisations have a large part to play in bringing to the notice of the public the necessity of family planning and impressing upon them its urgency. We would leave it to the voluntary and social organisations to carry on propaganda and having their own set-up for meeting their requirements. We suggest that financial aid should be given by the Government in sufficient quantity to enable these organisations to do so. But many of the conditions which are applicable to the expenditure of Government grants through governmental agencies *would not be applicable to those voluntary agencies*. All possible steps for increasing association and participation by voluntary and social organisations should therefore be taken, particularly in regard to measures of mass contact and education of the public. Necessary financial assistance should, of course, be provided for this purpose.

It has also been seriously suggested that the immensity of the problem and the all-out drive that is required to solve it within a reasonable period of time call for the creation of an independent Ministry at the Centre for dealing with the population problem. A plea has been made that even if such an independent portfolio were not to be created, it would be necessary to have some one at the highest level of Government in charge of the movement. We see in this suggestion, however, a strongly felt desire for the utmost drive and energy being put into

the family planning programme at the highest level. This need may be met by the Health Ministry being so enlarged as to give the Minister-in-Charge the assistance of a Minister of State.

(ii) Demographic Studies :

There is another matter of general importance in regard to family planning to which we would like to refer at this stage. An overall programme for the country as a whole has been drawn out and the plan of action is the same from State to State and from area to area irrespective of the local conditions. A State where the problem is of a very serious dimension tends to be treated in the same way as another where the situation may not be as serious. Then again the methods sought to be applied do not take into account sufficiently the differences in the social, economic, cultural and other factors from region to region or area to area. A much greater demographic, sociological and anthropological study is necessary before the methods best suited to each area can be developed. The application of a uniform pattern of population control measures throughout the country is in our view not likely to produce the optimum results on the one hand and on the other may result in undesirable repercussions which may not be discovered until it is too late. It is understood that a National Council on Population has already been set up under the Chairmanship of the Home Minister. We feel that the Demographic Advisory Committee should function under the Ministry of Health, so that all population problems may come under one Ministry and be dealt with on a national-wide scale.

(iii) Production of Contraceptives :

The existence of a paradoxical situation in regard to family planning has been brought to our notice. While on the one hand the message of family planning has perhaps not travelled as far and wide as it should and while intensification of the education and propaganda in this behalf is urgently required, on the other hand, it transpires that services and supplies are not often available to meet the demands for family planning advice and appliances. This brings into focus a very important question of the production and supply of appliances required for contraceptive purposes. The indigenous production, barring that of foam tablets, is practically insignificant and difficulties in regard to import licence and availability of foreign exchange are understood to have come in the way of adequate imported supplies being available. The educative part of the programme needs, therefore, to be adjusted to the availability of services, as great damage may result from the public not finding the requisite services readily available after having been prepared for family planning through education and propaganda. Indigenous production of contraceptive appliances should, in our view,

have been simultaneously taken in hand when the family planning programme was launched on a national scale and we consider, therefore, that a priority no less high than for any other major project should be given to the project of setting up of plants for the production of contraceptive appliances within the country so as to fully meet the anticipated needs within the next two or three years. In the meantime, for the purposes of the allocation of foreign exchange for the import of diaphragms and other requirements, a correspondingly high priority should be accorded.

(iv) Education and Propaganda :

In regard to the educational aspects of the movement, it is our feeling, that all the available media have not been utilised to the extent to which these should be utilised for persistently keeping before the public eye the problem of family planning. It has been suggested that in a crucial programme of such dimensions where each individual has to be prepared separately, the medium of the All-India Radio has not been utilised to the extent of a fraction of what should legitimately be considered as one of its main educational objectives. In addition to this, preparation of educative material in all regional languages including films, posters, pamphlets, charts, flannel-graphs, plays, puppet shows, etc. are other directions in which immediate action needs to be taken. Family Planning educational activity should be co-ordinated with the activities of the primary health centres, the community development blocks, the Social Welfare Board and other similar organisations engaged in constructive work. Irrespective of the immediate sphere of activity of any worker in the Community Development and Panchayat Raj Organisations, each worker coming in contact with the public should have orientation in family planning and should be instructed to bring home to the people in the rural areas the intimate relationship of economic uplift with the size of the family and the community. Some of us feel so strongly on the subject of mobilising public opinion and effort in this programme through all available channels, that it has been suggested that the help of all political parties should be enlisted, irrespective of their labels and denominations, through the use of the party organisation for spreading the message of family planning. We have given considerable thought to the desirability of the inclusion of sex education with a view to preparing the ground subsequently for family planning, in the teaching curriculum in schools and colleges. We feel that with the existing social patterns and cultural background of the teachers and the taught in the large majority of the schools and colleges in the country, any such measures may produce more harm than good. Education on the biological laws of life may however, be imparted in colleges.

(v) Sterilisation :

The steady rise in the rate of population growth during the past few decades and more particularly during the decennium, 1951-61, has brought to the forefront the importance of a many-sided attack on the problem. One of the methods of attack is a steady expansion of sterilisation facilities subject to certain safeguards. These safeguards should provide (a) that the operation is performed by competent medical men, (b) that the sterilisation should be offered only on a voluntary basis, (c) that both the husband and wife are made fully aware of its implications and agree to the operation, and (d) that due consideration is given to factors like the ages of the couple and the number of children. In the case of those requiring such help, a small financial assistance may be given as a compensation for loss of time and wages. It is understood that, in certain States, there has been a steady rise in the acceptance of sterilisation and the effects of these developments should be closely watched and studied, including investigations in the possibility of after-effects, if any. We suggest that follow-up studies should be initiated simultaneously with the object of obtaining a clearer understanding of the physical and psychological after effects of sterilisation.

(vi) Research :

Research activity needs in our opinion to be directed also towards the development of newer agents for the reduction of fertility. The problems of the preparation of the population of a whole country for family planning practices and of placing within their reach across the 5,00,000 villages the conventional requisites for birth control are stupendous. Even if this were to be achieved, the conditions of living are such that the utilisation of the facilities may not always be feasible. An effort therefore needs to be concentrated towards the discovery of agents that can substantially control fertility. The pilot studies now under way for the testing of the oral contraceptives should, therefore, be pursued more vigorously and evaluation and analysis of the results carried out in such a way that the potentialities of such a means are utilized without further loss of time, in the event of its usefulness being established.

One other aspect of the question which we wish to touch upon is that of the integration of family planning work with the entire range not only of the health services but of the activities of all departments where contact with the public is involved. The family planning movement should not be allowed to get identified with the family planning clinics as such. Family planning advice and assistance should be available to the members of the public at places and levels far more than in the family planning clinics only. In this connection, we feel that there is at present an unnecessary duplication in the organisation and

activities of the maternity and child health services and family planning. At the administrative as well as at the peripheral level family planning should be treated as an integral part of the total health services. At the administrative level instead of the family planning and the M.C.H. officers pulling in different directions, a combined administrative head should take care of what are essentially different phases of the same health programme.

(vii) *Summary :*

To sum up, our main recommendations in regard to the population problem briefly are :—

1. Much greater attention needs to be paid to the development of methods of population planning from region to region and from area to area than has been the case so far. Demographic, sociological and anthropological studies need to be carried out in different parts of the country to arrive at the most effective and practical way of devising measures for population control suited to each area.

2. The educational and propaganda aspects of the family planning movement with the object of mobilising all media of communication, particularly in the rural areas, need to be strengthened. Radio which is the most effective means of reaching the largest number of people, it is felt, is not being pressed into service to the extent it should be for constantly keeping before public mind the importance and urgency of the population problem. It is suggested that population planning should be treated as a non-party matter and all political parties should include it in their programmes as an essential major activity.

3. The indigenous manufacture of contraceptive goods including rubber appliances, should be given the highest priority. The country should produce its requirements of these before the middle of Third Five Year Plan period. Until technical advances place within our reach better means of birth control, condoms and foam tablets are the only defence against conception which can be placed within the reach of the large masses of population in the rural areas. Rubber Sheaths and foam tablets would therefore have to be made available through distribution centres in their thousands including hospitals, dispensaries, primary health centres, maternity and child health centres, sanitary inspectors, vaccinators, village level workers etc.

4. Family planning advice and assistance should be available not only through the family planning clinics but should be an essential part of the activity of all health agencies. Each and every health worker should be oriented in the technique and methods of family planning. Promotion of family planning activity should be one of the duties of the Panchayats and Panchayat Samities.

5. We note that the demand for sterilisation operations is gaining momentum and that some States have undertaken large scale sterilisation campaign according to certain established procedures. At the same time a careful study of the long term effects of sterilisation should be undertaken. We have already referred to the necessity of a study on the after effects of sterilisation.

6. Laboratory and field research in regard to oral contraceptives should be intensified.

7. For the required momentum to be given to the movement and for the enlistment of the support and co-ordination of other Ministries, the Health Ministry should be strengthened in such a way as to provide for a separate minister for population control so as to make it possible for one minister to devote all his time exclusively to family planning.

4. Note by five Members of the Committee

4. The following note contains certain views and further suggestions in regard to the implementation of the Family Planning Programme recorded by

1. Dr. K. C. K. E. Raja
2. Dr. C. O. Karunakaran
3. Dr. C. G. Pandit
4. Lieut.-Genl. B. M. Rao
5. Lieut.-Genl. B. Choudhury

Certain suggestions for accelerating the rate of spread of family planning :

A realisation of the urgency and magnitude of the population problem is evident from the provision of Rs. 27 crores for family planning during the Third Plan period and the recommendation of this Committee for augmenting the strength of the Ministry of Health to promote a more rapid implementation of the family planning programme. If the growth in population does not show any significant downward trend during the next five years, the introduction of appropriate legislative and administrative measures will have to be considered, in order to ensure a definite fall in the birthrate of the country. The following suggestions appear to us to deserve consideration in this connection. Some of them may be considered to be controversial and doubts may be expressed about the feasibility of their implementation. However the population problem is of such paramount importance to the country today that a discussion of matters relevant to a possible reduction of the rate of growth should be stimulated as widely as possible. These suggestions are put forward for the purpose of promoting such discussion :—

(a) A graded scale of taxation from the fourth confinement onwards :

The possibility of introducing a graded scale of taxation from the fourth confinement onwards should be seriously considered. This measure can prove to be deterrent in view of the fact that every one, rich or poor, would be anxious to avoid the payment of such a tax. The tax will be relatively small at the lower ranges of family income and it will rise progressively with increases in the resources of individual families. It may be objected that those who contribute most to population growth are the people at low levels of family income, that their ability to pay the suggested tax, unless it be a token amount, is doubtful and that the imposition of this penalty on childbirth may result in such an inroad into their meagre incomes as to reduce further the existing low standards of life of such families. There is considerable force in these arguments ; nevertheless, it would obviously be wrong not to explore all avenues of action likely to lead to a reduction of the birth rate. Moreover, the enforcement of this measure may be worked out in practice in such a manner as to make it more easily bearable by the people ; for example :

(1) A mother with two healthy children may be fore-warned that she would be offered sterilisation on the termination of her third childbirth and that, apart from the operation being offered to her free of charge, she would be given a prescribed amount as honorarium for the performance of what is deemed to be a national service.

It is only in the case of a woman who refused to take advantage of this offer that taxation of the family will be enforced from the fourth pregnancy onwards.

(2) The tax may be made payable in easy monthly instalments, when its payment has to be enforced in the case of poor families, a level of income being prescribed for the purpose.

Suggestions regarding the specific amount to be levied as taxes at different levels of family income are being purposely avoided ; nor is the question considered here as to whether those at the lowest level of income should be exempted from taxation and, if so, what that level should be ; these are matters requiring careful consideration after taking into account a variety of related factors ; further, decision on them can profitably be postponed until the question of acceptance of taxation on the lines suggested above is decided.

It is considered that, even if the whole community cannot be included within the range of action of the proposed tax, a good deal will have been gained if a large section of the people can be brought within its scope. It is justifiable to assume that contraceptive practice, even under favourable circumstances, would not have extended to every

section of the community in any country and that the rate of spread would be slow. There is sufficient evidence to show that, in a country like England with a definitely higher level of family income and a wider spread of general education among the people than in India — these are factors which actively help to promote family planning — birth control started among the higher strata of the community and reached gradually down to the lower strata and that the period over which this spread of contraception took place might have been about 75 years. Further, it is doubtful whether, in England or in any other country, the lowest level among the special classes would have taken to contraception in an effective manner; it is this class that includes, by and large, the mentally retarded and those who are improvident and are incapable of exercising any reasonable measure of self-control. The fact that, for obvious and uncontrollable reasons, certain sections of the people cannot fall in line with a national programme of family planning is never advanced as a reason for giving up community effort to spread contraceptive practice. Similarly, a programme of taxation designed to discourage excessive childbearing should not be condemned because it may not be possible to extend its operation to all sections of the community.

(b) Removal of disadvantages regarding income-tax in respect of unmarried persons :

Under the Income-tax Rules a married individual has certain advantages in respect of income slabs below Rs. 5,000/- these concessions extending to all persons whose annual incomes do not exceed Rs. 20,000/-. An unmarried person gets exemption from income-tax only on the first Rs. 1,000/- and, on the balance of 4,000/-, he has to pay 3 per cent. In the case of a married person, the first Rs. 3,000/-, Rs. 3,300/- and Rs. 3,600/- are exempt from taxation according as the individual has no child, a single child or more than one child. Thus, in the case of a married person the 3 per cent tax becomes levied only on Rs. 2,000/-, Rs. 1,700/- or Rs. 1,400/- as the case may be in relation to the number of children. At the lower income ranges there is therefore some discrimination against bachelors and spinsters in respect of income-tax. While we recognise that the concessions given to married persons with children have justification, it is for consideration whether bachelors and spinsters should be penalised by being made to pay higher rates of income-tax; in fact, by remaining single they are making a contribution to the solution of the population problem. It may not be unreasonable to equate them with married persons with no children and to give them the benefit of exemption for the first slab of Rs. 3,000/- in their incomes.

The problem is not insignificant in character in so far as the concessions now in force relate to persons with incomes of Rs. 20,000/- or less per year. This figure would include all individuals with incomes

of Rs. 1,666-67 per month or less. With a per capita income in the country of about Rs. 300/- per annum, it is obvious that a large percentage of the people would be able to avail themselves of these concessions. Of them the majority are bound to be in the smaller income group with Rs. 5,000/- or less per year. The campaign for family planning must direct itself to this large section of the people, which may also include an appreciable proportion of unmarried persons. In their case a removal of the present concessions on the lines suggested above would help to make these single persons feel that they are not being discriminated against. This may have some psychological effect in the all-out campaign for population control.

(c) Withdrawal of maternity benefit in the case of those refusing to accept family limitation :

The grant of maternity benefit to women employees in the services of governments and local bodies and of private schools and other institutions receiving grants from public funds should be limited to the first three pregnancies of each such employee. A withdrawal of this benefit from subsequent periods of pregnancy and confinement will undoubtedly have some value as a deterrent.

(d) Limitation of certain free services rendered by the State to children :

Free education and other benefits conferred by the State on children may be limited to three children in each family. Some discrimination will have to be exercised, however, in examining each such free service before it is excluded ; some may have to be retained and extended to all in the interests of national efficiency e.g., free midday meals.

(e) Increasing participation by employees of governments, local bodies and aided institutions in the spread of family planning :

Government servants, including the medical and public health staff, and all those who are employed by local bodies and aided institutions, including teachers, should be encouraged to take an increasing part in spreading the contraceptive movement. They form a body of educated persons, whose sense of responsibility towards their own families and towards the community should be higher than that of an ordinary member of the general public. It is therefore their duty to participate actively in an educational campaign for the spread of family planning.

(f) Abortion for socio-economic reasons :

The offer of public medical facilities for abortion has been shown to be an effective method for bringing down the birth rate significantly within a short time. Japan used this method successfully to cut down

its birth rate by one-half (from about 34 per 1,000 population to 17) in the course of a few years. Yet it is significant to note that the health hazards faced by women, particularly young women, even when the operation is done repeatedly by qualified medical men, are so great that Japan would like to replace abortion as quickly as possible by contraceptive practice.

It is equally pertinent to refer to the experience of the Soviet Union. In that country, in the wake of the Revolution of 1917, abortion was legalised and was widely practised. About 1936, the Soviet Government put a ban on abortion and later, in 1955, removed this ban. It is understood that this removal was based on the experience that, by withdrawing legality, abortion was not stopped but that the practice went underground. Absence of legal sanction led to the operation being done, in many cases, by those not medically competent to do it and the consequences on the health of the women who were concerned were far from satisfactory. Nevertheless, although the ban on abortion was withdrawn in 1955, it is understood that informed opinion in Russia is anxious to seek a regulation of family growth by the spread of contraceptive practice and that intensive research is in progress to facilitate an expansion of that practice.

In India such evidence as is available shows that an appreciable number of abortions is taking place every year. It is likely that most of them are done by persons with no medical competence to perform abortion and in the circumstances these abortions are likely to cause harm to the health of the patients. How to tackle the problem is a difficult question to answer. Even with a wide expansion of health services in the country, if legal status is conferred on abortion only in respect of the operation performed for reasons of health, the problem of ensuring that the vast majority of cases of abortion taking place in the country would be performed under conditions of proper medical care would remain largely unsolved. Can abortion be legalised in India for socio-economic reasons, as has been done in some other countries? We are aware that there are weighty reasons against such legislation, including strong religious and social reactions of an adverse nature. Nevertheless, we believe that we are right in holding that a good deal of abortion does take place in the country under conditions which are wholly undesirable. The problem requires serious study and an unbiased approach towards its solution by governments and the people. We do not propose to go farther in expressing our opinion on the subject.

On one point we are clear in our minds. We are not prepared at present to recommend large-scale abortion as a legalised measure to combat successfully the population problem of the country.

CHAPTER XI

DRUGS AND MEDICAL SUPPLIES

CONTENTS

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1. Recommendations of the Bhoré Committee

On a review of the position regarding the control on the import, manufacture, sale and distribution of drugs and other medical requisites, the Bhoré Committee had drawn attention to the need for the setting up of a Central Drugs Laboratory and the introduction of the Pharmacy Act. Both of these have since come into existence. That Committee drew pointed attention to the fact that the impetus given to the drug industry in the country by the war should be sustained by planned and vigorous action by the Government. The Committee took note of the fact that the country depended until the war almost entirely on imported drugs, instruments and appliances which made it possible for the parties concerned to manipulate things in a manner as to lead to high price, to scarcity and to the creation of monopolies. It was noted that at that time there was hardly any worthwhile manufacture of glassware and of instruments within the country. The basic principles which should govern the development of the drug industry in the country were broadly as follows in the view of that Committee.

The final responsibility to see that the essential needs of the country in respect of important medical requisites are met, should rest with the Government. It should be possible to meet the essential needs through a combination of private enterprise suitably assisted, where necessary, and protection by the State where this is found to be in the public interest. Biological products required for the prevention and treatment of diseases should particularly be the responsibility of the Government which should not make their production a source of profit. The setting up of a small ad hoc committee to examine the question of the requirements of the country in respect of drugs and other medical requisites and of the need for the setting up of an adequate standard of purity and potency of drugs was also stressed by that Committee.

2. Recommendations of the Pharmaceutical Enquiry Committee

A Committee called the Pharmaceutical Enquiry Committee was set up accordingly by the Government of India. The main recommendations of the Committee which submitted its report to the Government in 1954 were as follows :

1. Each manufacturing concern should endeavour to produce as many fine chemicals and drugs as possible starting from

basic chemicals, and/or intermediates as close to the basic chemicals as practicable, to meet not only its own requirements but also those of other firms. There should be better co-operation between local manufacturing firms for the production of fine chemicals and drugs, and efforts should be made to discourage imports.

2. The Government Medical Stores Depots should be re-organised and methods changed to conform to commercial practices. Items of manufacture which are not being adequately made by the private sector should be taken up.
The supply position of stores manufactured at the Government Medical Stores Depots should be improved and prices reduced. The Stores Depots if necessary, may be handed over to the respective State Governments.
3. Methods should be adopted for improving the quality of opium produced at the Opium Factory. Commercial methods of marketing the different products of the factory and resort to advertisements in Indian and foreign scientific and trade journals should be adopted.
4. A well-equipped research laboratory and a pilot plant should be set up at the Pencillin Factory, Pimpri, for carrying out investigations side by side with manufacture. To meet the increasing demand of penicillin in the country, the Government should either encourage the private sector to fill the gap or increase the capacity of the factory. The factory should also undertake manufacture of other antibiotics particularly streptomycin. Manufacture of certain chemicals used to produce penicillin as also production of synthetic anti-malarials, and sulpha drugs should be started or accelerated.
5. A research unit and a pilot plant should be provided at the *D.D.T. Factory* to carry out investigations on the production of new types of insecticides. To meet the demands of D.D.T. the Government should either themselves put up a second D.D.T. unit or encourage the private sector to manufacture the balance of requirements.
6. In view of the uncertain position of quinine, Government should not invest in new plants. The existing plants should be replaced by modern equipment and modern techniques adopted so as to bring down the cost of production and improve quality and quantity of quinine produced. Commercial methods of marketing quinine should be adopted by the Gov-

- ernments concerned. Dumping of foreign quinine into the country should be prevented. Customs duty should be imposed on synthetic anti-malarials and foreign quinine. For the disposal of accumulated stocks of cinchona febrifuge the State Governments, the District and Local bodies and other bodies should be requested to make greater use of the product to meet their requirements of anti-malarials.
7. The brisk competition between the two State Governments (Bombay and Madras) in the sale of their Shark Liver Oil should be discouraged. There should be better co-ordination between the two Governments in respect of procuring shark liver and marketing their products so as to ensure a fair price and discourage unhealthy competition.
 8. The production of hyperimmune rabies serum at the Haffkine Institute should be increased and made more easily available. Steps should be taken to increase the output of diphtheria and tetanus vaccines and an attempt made to manufacture the triple vaccine required for the simultaneous prophylaxis of vulnerable groups of population against these diseases. Similarly the Haffkine Institute should be actively encouraged to produce influenza vaccine. The anti-venine produced at the Haffkine Institute should also be made available to the public in emergencies by allowing it to be purchased and stocked by retail chemists and druggists. The Government should afford necessary facilities to the Haffkine Institute to expand the snake farm and increase its out-put, and other institutions should be encouraged to start snake farms and produce anti-venine.
 9. The production by the Haffkine Institute of sulpha drugs should not be stopped, but accelerated. If necessary this activity may be undertaken by the Bombay Government as a separate enterprise.
 10. No new foreign concerns should be allowed to set up factories unless they undertake to manufacture products which have not been manufactured in adequate quantities by other factories, starting from basic chemicals and/or intermediates as near to the basic chemicals as possible, within a reasonable time.
 11. The foreign manufacturers of pharmaceuticals should be forbidden to make arrangements to sell bulk chemicals to other processors, and they should also be discouraged to make

arrangements with firms in India to manufacture other useful and latest drugs based on the original products prepared in collaboration with the latter.

12. The Patent Laws of the country should be amended to secure effective utilisation of all developments in the field of science and medicine, wherever necessary in the interest of the country.
13. The guiding principles in permitting collaboration with foreign firms should be
 - (i) cosmetic items such as tooth pastes, eau-de-cologne, creams etc., to be excluded ;
 - (ii) Compounding of selected drugs on basis of essentiality, provided the firm agrees to commence the manufacture of a few basic drugs from primary raw materials and complete its programme of manufacture of basic drugs within a specified period ; and
 - (iii) monopolies should not be allowed to come into existence but competition should be kept alive.

In the matter of preference for foreign collaboration the Committee suggested that products manufactured wholly in India from basic raw materials and/or intermediates as near to the basic chemicals as possible of mainly Indian origin should be given priority. In future there should be little scope for foreign collaboration in regard to products in which the finished drugs are imported in bulk and packed or repacked here for sale.

14. Import of finished products like synthetic drugs, antibiotics, vitamins and hormones should be gradually reduced and the existing processing capacity in the country should be utilised *fully by importing them in bulk and processing them until their production develops in the country.*
15. Tie-ups with foreign firms including participation in capital should be preferred to 'tie-ups' with no foreign participation in capital — the participation of foreign capital of course generally not exceeding 49 per cent.
16. Firms with 100 per cent foreign capital — the so-called 'India Ltd' and branches of foreign firms — should not be permitted to be established except under special circumstances, for the manufacture of basic chemicals and drugs, which the Indian managed factories are not able to take up.

17. Royalty need only be paid on essential drugs like hormones, vitamins and antibiotics or those included in the list furnished to and certified by the Ministry of Commerce and Industry. Payment of rates of royalty for pure 'know-how' as agreed by some firms is excessive and this should be reduced to a reasonable figure, when current agreements come up for revision. Payment of royalties for the exploitation of registered trade mark or proprietary name should be discouraged. Agreements for payment of royalties should be revised every five years, although in special cases Government may permit agreement for a longer period initially. In all agreements suitable provision should be made for training of Indian personnel.
18. In the matter of permitting large scale private enterprise under Indian management new firms should not be allowed to start the manufacture of Galenicals of which there is already a surplus capacity. Licences issued under the Drugs Act should be withdrawn from the firms producing sub-standard drugs. To prevent manufacture of sub-standard drugs the plant and equipment and staff employed in the manufacturing firms should be scrutinised.

3. Main developments in the last decade

The main developments that have taken place in the meantime are briefly as follows :

- (1) Enforcement of the Drugs Act and the establishment of a machinery at the Central and the State levels for supervision and control of drug manufacture, distribution and sale ;
- (2) Passing of the Pharmacy Act and the setting up of the All India and State Pharmacy Councils ;
- (3) The passing of the Drugs and Magic Remedies Act ;
- (4) The setting up of a Central Drugs Laboratory ;
- (5) Establishment under the public sector of plants for the manufacture of Penicillin and D.D.T. with the assistance of UNICEF ;
- (6) Increase in the production of drugs by indigenous manufacturers ;
- (7) Grant of licences to certain foreign drug houses for the progressive manufacture of their products by themselves within the country or in collaboration with local counterparts ; and

- (8) Finalisation of a scheme with the U.S.S.R. Government, for the setting up of four plants for the manufacture of Antibiotics, Phytochemicals, Synthetic Drugs and Surgical Instruments.

The Committee paid special attention to the question of manufacture, testing, distribution and sale of drugs in the course of its tours.

It also went into the organisation, methodology and progress of implementation of the projects as originally proposed by the respective firms before receiving their licenses, particularly in respect of big firms both foreign and Indian. It discussed with managements their future programme and their respective ideas on research in pharmaceutical and allied subjects and tried to ascertain their difficulties and problems.

Almost all major manufacturing houses in the country were visited by groups of members, accompanied in some cases by the Drugs Controller (India) and discussions were held with the individual manufacturers, their representative organisations, pharmaceutical associations, Drug Control Administrators etc.

We propose to divide our comments and recommendations under the heading of (1) Drug Industry, (2) Drug Control, (3) Patent Law, (4) Instruments and Appliances, (5) Standardisation, (6) Medical Store Depot Organisation, and (7) Research and cultivation of medicinal plants.

4. Drug Industry

India has only recently emerged as a manufacturing country. As a first step import of finished preparations i.e., preparations that are presented in readymade sealed packings, has been virtually stopped with the exception of a few preparations. Side by side new processing units have been established and old ones expanded. Thus, the industry caters roughly to the total needs of the country by formulating and packaging drugs from imported finished or semi-finished drugs. A few units designed to undertake the basic manufacture of drugs from imported intermediaries and other basic materials have also been established. Most of these units are in the private sector, some entirely Indian and others with foreign capital and technical participation. A few remain wholly foreign-owned. The present position with regard to the existing manufacturing capacity and the plans for the near future in respect of the following main groups of drugs is stated in the paragraphs below :—

- (1) Antibiotics,
- (2) Sulpha drugs,
- (3) Anti-tubercular and anti-leprosy drugs,

- (4) Vitamins,
- (5) Hormones, including synthetic corticosteroids,
- (6) Insulin, Diethyl Carbamazine etc., and
- (7) Anti-dysentery drugs.

(1) Antibiotics :

Penicillin : The target fixed for the Third Plan period is 120 million mega units. The Hindustan Antibiotics, Pimpri, is making about 40 million mega units. Two more units have been licensed to produce about 20 million mega units. The balance will be made in the unit to be established under the U.S.S.R. Scheme. With the exception of solvents required for its extraction most of the raw materials required for the manufacture of penicillin are available indigenously. The price at which Penicillin is produced and sold in bulk is higher than the price at which it can be imported. With improved techniques one should expect that it would be possible to bring down the prices. The quality of Penicillin produced at Pimpri has been found to be good. Stringent measures are taken to control the quality and no batch which does not pass all the prescribed tests is released for sale. The present consumption is between 60-65 million mega units.

Streptomycin : The target fixed for the Third Plan period is 150 tons. The Pimpri Plant is expected to go into production in 1961 and will produce 45 tons when it works to the full capacity. The manufacture is being undertaken in collaboration with M/s. Merck of U.S.A. Imports are at present canalized through Hindustan Antibiotics based on global tenders. This has not only resulted in considerable saving of foreign exchange but has also resulted in a considerable reduction of price to the consumers. Streptomycin which used to sell at Re. 1.00 to Rs. 1.25 per gramme only a couple of years ago now sells at 58 nP. per gramme. The quality of imported Streptomycin is checked both at the time of import as well as after. 85 tons of streptomycin will be produced at the unit to be established under U.S.S.R. aid and 20 tons in the private sector. The present consumption is about 90 tons per year.

Chloramphenicol : This is a synthetic antibiotic. Target fixed for the Third Plan period is 5 tons. The present licensed capacity in the private sector is only 15 tons. Although this capacity was licensed more than five years ago up till now there has been no local production. Whatever little there is, is produced from a penultimate compound.

Tetracyclines : (including Chlortetracycline, Oxytetracycline and Tetracycline). The target for the Third Plan period is 50 tons. Most of this will be made in the unit to be established under the U.S.S.R. aid. The Hindustan Antibiotics have developed a process and have been

licensed to produce 1.5 tons. Two more units, subsidiaries of American manufacturers in the private sector, have also been licensed to produce tetracyclines. One unit in the private Sector and the Hindustan Antibiotics both have just gone into production. The present consumption is about 5.0 tons per year.

(2) Sulpha Drugs :

The target for the Third Plan is 1000 tons. The capacity already licensed, almost all in the private sector, is about 476 tons. The remaining will be undertaken in the unit to be established under the U.S.S.R. aid. The present consumption is about 880 tons.

(3) Anti-tubercular and Anti-leprosy drugs :

PAS and its salts : The target for the Third Plan is 400 tons. A capacity of 126 tons has been already licensed in the private sector. 200 tons will be manufactured in the public sector. The present consumption is about 200 tons and production about 100 tons.

I.N.H. : The targets for the Third Plan is 100 tons. The capacity already licensed is 34 tons. 20 tons will be produced at the unit to be established with the aid of U.S.S.R. The present consumption is about 30.3 tons and production about 30 tons.

Anti-Leprosy Drugs : D.D.S. The target fixed for Third Plan is 40 tons and the licensed capacity 18.3 tons. Actual production was, however, only about 4 tons during 1959-60. About 3 tons were imported during the year. A shortage of this drug was reported.

(4) Vitamins :

Vitamin A : Two units with a total capacity of 20 tons have gone into production. This quantity is enough to meet the medicinal requirements, as well as the requirements of the vanaspati industry. The manufacture is at present carried on from imported intermediates, but very soon one of the basic materials will be synthesised from Lemon grass oil available indigenously.

Vitamin C : The target fixed for Third Plan is 135 tons. Plans have been approved for the manufacture of 60 tons of Vitamin C in one unit in the private sector. The Hindustan Antibiotics have also put up a proposal to exploit the process developed at the National Chemical Laboratory for a capacity of 40 tons. The unit in the private sector is ready to go into production.

Vitamin-D₂ : Recently a firm has been licensed to manufacture Vitamin D₂ in capacity sufficient to meet the current needs of the country.

Vitamin-B₁₂ : The target for the Third Plan is 25 Kgs. per year. Two units in the private sector have been licensed to manufacture this quantity. Actual consumption during 1959-60 was 13.0 Kgs.

The manufacture of other vitamins has not yet been contemplated and the country's requirements are met by imports.

(5) Hormones :

Two firms have been licensed to manufacture synthetic corticosteroids. The total licensed capacity is 398 kgs. Import during 1959-60 was about 165 kgs. These hormones have also been manufactured locally from imported intermediates.

(6) Insulin :

The target for the Third Plan has been fixed at 1,000 million units. The quantity imported during 1959-60 was about 550 million units. A review of the imports during the course of the last few years has indicated a steep rise in the consumption of insulin. Oral anti-diabetics are also being largely used. There is no manufacture yet in the country. A proposal for the manufacture of 1000 million units of insulin from imported pancreas which was under consideration has now been accepted and the licence granted to the party for its manufacture.

Diethyl carbamazine (Hetrazan) : The target fixed for the Third Plan is 75 tons. Two units have been licensed to produce 25 tons. 30 tons will also be manufactured in the unit to be established with the U.S.S.R. aid. There has been no local production.

(7) Anti-dysentery drugs :

Iodo-chlor and diiodo-Hydroxyquinolines : The target fixed for the Third Plan is 75 tons. The capacity licensed in the private sector is 73.7 tons. The production in 1959-60 was about 23 tons. Imports are not allowed on account of indigenous production.

Emetine : Two firms have been licensed for a total capacity of over 500 kgs. The raw material namely Ipecac is mostly imported. The licensed capacity is more than enough to meet the current requirements.

In addition licence has been granted for the production of drugs such as piperazin citrate, chloroquine sulphate etc. Only one firm is manufacturing chloroquine. With the increasing use of chloroquine in the treatment of amoebiasis the capacity for the manufacture of the drug will have to be considerably enlarged.

This review gives only the broad basis of the development of pharmaceutical industry. There are several other drugs also which are being manufactured or will be manufactured basically in the country, for example aspirin, soda salicylas, etc.

It has been brought to our notice that in some cases the price at which the basic drugs are manufactured and sold in the country is much higher than the price at which the same drugs can be imported. This is accounted for by the high cost of some of locally manufactured basic chemicals such as sulphuric acid, caustic soda, etc. However, it has been noticed that in some cases the cost of the imported raw materials was much higher than the cost of the finished product. This feature was particularly noticeable in the case of those units which are the subsidiaries of foreign firms. There is a case for going into the cost structure of the manufactured drugs and it should be possible to bring down the cost of drugs if a thorough probe is made into the costing of these drugs. This can be done under the provision of the Industries (Development and Regulation) Act.

Formulations placed in the market, provide an opportunity to manufacturers especially in the case of preparations of some standing introduced by foreign manufacturers, to collect higher prices than justified by the cost of the ingredients. This also needs to be looked into.

Sterilized catgut ligatures: In spite of present day use of other than catgut ligatures, such as silk, nylon and such other threads, the requirements of catgut ligatures will remain in great demand. So far, however, no firm is producing it from the base although during the war the Central Research Institute could meet a major portion of the requirements of sterilised ligature of the Armed Forces of the B.P. standard, after trials and experiments for six to nine months.

5. Manufacture of Drugs

It is computed that there are about 2800 major, medium, and small manufacturers in the country holding manufacturing licences. All of them are required to obtain manufacturing licences under the Drugs Act. Such licences are issued by the licensing authority, which is generally the Drugs Controller of the State Government, on its being satisfied with regard to the competence of the applicant in regard to plant, equipment, personnel and premises. Manufacturers employing over 100 workers, or having a capital investment of more than Rs. 10 lakhs are, however, required also to take licence under the Industries (Development and Regulation) Act. The number of such firms is, however, not more than 125 out of the total of 2,800 manufacturers. Under the cir-

cumstances, it would not be surprising if the large bulk of pharmaceutical products in the market is from medium and small manufacturers. In this connection, it would be significant to point out that one of the manufacturing houses visited in Bombay, although not licensed under the Industries (Development and Regulation) Act, had a turn-over Rs. 12 lakhs per annum. One of the results of this dispensation is that the organised industry is faced with competition from small investors, with little or no overheads, bottling and tableting under indifferent conditions and placing their products in the market at rates very unfavourable to the organised industry. The quality control facilities at the disposal of such medium and small manufacturers are either deficient or absent. The pharmaceutical industry has, therefore, to contend with competent know-how, big capital, world-wide sales and competent organisation, on the one hand, while on the other, it has to face unfair competition from mushroom units producing poor quality products.

Industries (Development and Regulation) Act :

On the other hand, the licensing regulations under the Industries (Development and Regulation) Act are more concerned with the development of the pharmaceutical industry as an industrial enterprise of the country rather than one whose chief concern is to produce quality goods for the consumer at rates within his means. The licensing procedures are also long and tortuous. Every time a licensee undertakes the manufacture of a new item it is necessary for him to have his licence re-endorsed. The manufacturing schedules of many concerns were stated to have been held up merely on account of this requirement, although they were otherwise quite ready to go into production and although the new item was in no way in the nature of a major departure from the line for which the manufacturer is already licensed. The fact that the actual users' license for the import of raw materials and intermediates required by the industry was based on the averages of the past demands also seriously hamstrings the expansion programmes of the industry. The fact that duties have to be paid on imported raw materials in some cases at a rate higher than that for finished products, makes it difficult for the indigenous industry to produce marketable commodities. Raw materials and intermediaries are controlled by chemical houses and cartels in foreign countries which sometimes makes it difficult for the Indian firms to produce goods which could compete with those imported or manufactured in India by firms collaborating with foreign capital and know-how. The indigenously available raw material is so variable in quality that inspite of 'warranty', stringent tests in regard to quality are still necessary. The basic chemical industry being very poorly developed, the pharmaceutical industry is necessarily tied to the apronstrings of imports and the large number of such items going into the manufac-